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```
TTTTTTTTTT  TTTTTTTTTT  YY      YY   SSSSSSSS  TTTTTTTTTT  RRRRRRRR     SSSSSSSS  TTTTTTTTTT  PPPPPPPP
TTTTTTTTTT  TTTTTTTTTT  YY      YY   SSSSSSSS  TTTTTTTTTT  RRRRRRRR     SSSSSSSS  TTTTTTTTTT  PPPPPPPP
    TT          TT      YY      YY  SS            TT      RR      RR  SS            TT      PP      PP
    TT          TT      YY      YY  SS            TT      RR      RR  SS            TT      PP      PP
    TT          TT       YY  YY    SS            TT      RR      RR  SS            TT      PP      PP
    TT          TT        YY YY     SS           TT      RR      RR   SS           TT      PP      PP
    TT          TT         YY        SSSSSS      TT      RRRRRRRR       SSSSSS     TT      PPPPPPPP
    TT          TT         YY        SSSSSS      TT      RRRRRRRR       SSSSSS     TT      PPPPPPPP
    TT          TT         YY              SS    TT      RR   RR              SS    TT      PP
    TT          TT         YY              SS    TT      RR   RR              SS    TT      PP
    TT          TT         YY              SS    TT      RR    RR            SS    TT      PP              ....
    TT          TT         YY              SS    TT      RR    RR            SS    TT      PP              ....
    TT          TT         YY      SSSSSSSS      TT      RR      RR  SSSSSSSS      TT      PP              ....
    TT          TT         YY      SSSSSSSS      TT      RR      RR  SSSSSSSS      TT      PP              ....

LL              IIIIII      SSSSSSSS
LL              IIIIII      SSSSSSSS
LL                II      SS
LL                II      SS
LL                II      SS
LL                II       SSSSSS
LL                II       SSSSSS
LL                II             SS
LL                II             SS
LL                II             SS
LL                II             SS
LLLLLLLLLL      IIIIII    SSSSSSSS
LLLLLLLLLL      IIIIII    SSSSSSSS
```

Table of contents

TT
V0

```
0000     1          .TITLE  TTYSTRSTP - Terminal driver start/stop I/O routines
0000     2          .IDENT  'V04-000'
0000     3
0000     4 ;
0000     5 ;*****************************************************************************
0000     6 ;*                                                                           *
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0000    24 ;*                                                                           *
0000    25 ;*                                                                           *
0000    26 ;*****************************************************************************
0000    27 ;
0000    28 ;++
0000    29 ; FACILITY:
0000    30 ;
0000    31 ;       VAX/VMS TERMINAL DRIVER
0000    32 ;
0000    33 ; ABSTRACT:
0000    34 ;
0000    35 ;       THIS MODULE CONTAINS ROUTINES PERTAINING TO STARTING AND COMPLETING
0000    36 ;       I/O REQUESTS.
0000    37 ;
0000    38 ; AUTHOR:
0000    39 ;
0000    40 ;       R.HEINEN 10-OCT-1977
0000    41 ;
0000    42 ; Revision history:
0000    43 ;
0000    44 ;       V03-030 MIR0450         MICHAEL I. ROSENBLUM            27-JUN-1984
0000    45 ;               Add code to the free linefeed logic to account for PC_NOCRLF.
0000    46 ;               Fix problem that causes the first linefeed typed on a
0000    47 ;               read with no prompt to not be echoed.
0000    48 ;
0000    49 ;       V03-029 RKS0029         RICK SPITZ                      10-APR-1984
0000    50 ;               Enhance virtual terminal connect action routine to
0000    51 ;               perform an implicit set mode operation.
0000    52 ;
0000    53 ;       V03-028 MIR0370         Michael I. Rosenblum            20-Mar-1984
0000    54 ;               Put code in to fix problems with lines and prompts causing
0000    55 ;               wrap.  Fix bug that would cause FMS programs to crash the
0000    56 ;               system.
0000    57 ;
```

```
0000     58 ;        V03-027 RKS0027         RICK SPITZ                      05-MAR-1984
0000     59 ;                Enhance write post completion to handle the case
0000     60 ;                of a write completion with no current PUCB.
0000     61 ;
0000     62 ;        V03-026 MIR0310         Michael I. Rosenblum            09-Feb-1984
0000     63 ;                Fix bugs.
0000     64 ;                make sure setting nomodem on a modem terminal shuts down
0000     65 ;                   the line.
0000     66 ;
0000     67 ;        V03-025 MIR0300         Michael I. Rosenblum            30-Jan-1984
0000     68 ;                Add input fallback
0000     69 ;
0000     70 ;        V03-024 MIR0085         Michael I. Rosenblum            26-Aug-1983
0000     71 ;                Remove references to DCL_OUTBND and DCL_CTRLC.
0000     72 ;
0000     73 ;        V03-023 MIR0082         Michael I. Rosenblum            19-Aug-1983
0000     74 ;                Make autoxoff mode work with passall and ttsync.
0000     75 ;                Fix pasthru to remain enabled after a read completes.
0000     76 ;
0000     77 ;        V03-022 MIR0080         Michael I. Rosenblum            28-Jul-1983
0000     78 ;                Move newline code into write done rather than TTYFDT
0000     79 ;                Reposition routines in the module.
0000     80 ;
0000     81 ;        V03-021 MIR0070         Michael I. Rosenblum            13-jul-1983
0000     82 ;                Fix bug that would cause TTY$DISCONNECT to be called twice.
0000     83 ;                if a SETMODE with the HANGUP modifier was issued.
0000     84 ;
0000     85 ;        V03-020 MIR0051         Michael I. Rosenblum            23-Jun-1983
0000     86 ;                Fix missing litterals in connect and disconnect code.
0000     87 ;                Check write active bit in getnextwrite to insure that
0000     88 ;                The write queue is not reordered.
0000     89 ;
0000     90 ;        V03-019 RKS0019         RICK SPITZ                       7-JUN-1983
0000     91 ;                ADD CONNECT/DISCONNECT ACTION ROUTINES.
0000     92 ;                ENHANCE WRITE DONE FORK PROCESS TO ALWAYS USE REQCOM
0000     93 ;                IF THE WRITE IRP IS POINTED TO BY UCB$L_IRP
0000     94 ;                MAKE SURE LUCB IS NOT DETACHED AT THE ALTERNATE WRITE ENTRY.
0000     95 ;                REMOVE CTRLY HANGUP CHECK, AS IT IS STILL DONE IN FDT.
0000     96 ;
0000     97 ;        V03-018 RKS0018         RICK SPITZ                      16-MAY-1983
0000     98 ;                MOVE SEGMENTS OF CHARACTERISTICS FDT CODE TO TTYSTRSTP
0000     99 ;                TO ALLOW CLEAN DISCONNECT OF DISCONNECTED TERMINALS.
0000    100 ;                RESTORE LUCB FROM LUCB IN READ/WRITE DONE.
0000    101 ;
0000    102 ;        V03-017 MIR0050         Michael I. Rosenblum            11-May-1983
0000    103 ;                Remove code that special cased broadcasts.  Allow the
0000    104 ;                data returned by timeout errors to be stored in the recall
0000    105 ;                buffer.  Make write post complete broadcasts.
0000    106 ;
0000    107 ;        V03-016 MIR0030         Michael I. Rosenblum            30-Mar-1983
0000    108 ;                Integrate Read verification with the standard driver
0000    109 ;                Add support for alternate frame sizes.
0000    110 ;
0000    111 ;        V03-015 MIR0029         Michael I. Rosenblum            22-Mar-1983
0000    112 ;                Add field to the iosb when itemlist reads are used.
0000    113 ;
0000    114 ;        V03-014 RKS0014         RICK SPITZ                      14-MAR-1983
```

```
0000   115 ;               ADD SUPPORT FOR LOGICAL UCB. NOTE THAT THE DRIVER
0000   116 ;               SWITCHES TO PHYSICAL UCB CONTEXT AT STARTIO ENTRY. IT
0000   117 ;               RESTORES LOGICAL UCB CONTEXT PRIOR TO RETURNING TO THE
0000   118 ;               SYSTEM.
0000   119 ;
0000   120 ;       V03-013 MIR8026         Michael I. Rosenblum            14-Mar-1983
0000   121 ;               Fix bug in partail escape sequence processing.
0000   122 ;
0000   123 ;       V03-012 MIR5026         Michael I. Rosenblum            10-Mar-1983
0000   124 ;               Fix security whole with command recall and the password
0000   125 ;               by not allowing noecho strings to be stored in the recall
0000   126 ;               buffer.
0000   127 ;
0000   128 ;       V03-011 MIR1024         Michael I. Rosenblum            09-Mar-1983
0000   129 ;               Fix code in getnxtwrite to look at the read packet
0000   130 ;               rather than UCB$W_BCNT to find the number of characters
0000   131 ;               that have been read so far.
0000   132 ;
0000   133 ;       V03-010 MIR0026         Michael I. Rosenblum            01-Mar-1983
0000   134 ;               Add code to save the results of the last read.
0000   135 ;
0000   136 ;       V03-009 MIR0024         Michael I. Rosenblum            28-Jan-1983
0000   137 ;               Update code to use the new read packet format
0000   138 ;
0000   139 ;       V03-008 MIR0023         Michael I. Rosenblum            24-Jan-1983
0000   140 ;               Read buffer was used after it was deallocated if a
0000   141 ;               Cancel was issued while EDITREAD state was in affect.
0000   142 ;               Changed READONE code to clear the edit read states
0000   143 ;               when a read is completed.
0000   144 ;
0000   145 ;       V03-007 MIR0016         Michael I. Rosenblum            4-Jan-1983
0000   146 ;               Change TTY$STARTOUTPUT to use the UCB OUTYPE field to determine
0000   147 ;               the necessary action when TTY$GETNEXTCHAR is called.  This change
0000   148 ;               should illiminate the checking the volitale condition code bits
0000   149 ;               that previously had the function of OUTYPE.  For compatibility
0000   150 ;               purposes only we are setting the correct condition codes.
0000   151 ;
0000   152 ;       V03-006 MIR0015         Michael I. Rosenblum            20-Dec-1982
0000   153 ;               Change TTY$V_ST_UNSOL and TTY$V_ST_GETAHD to TTY$V_FD_UNSOL
0000   154 ;               and TTY$V_FD_GETAHD, to reflect changes in the fork dispatcher
0000   155 ;               also change PORT_DISCONNECT call to refer to
0000   156 ;               CLASS_MODEM_DIS.  Change all port calls to call the Class
0000   157 ;               driver jacket routines.
0000   158 ;
0000   159 ;       V03-005 MIR0013         Michael I. Rosenblum            16-Dec-1982
0000   160 ;               Fix up refferences to new ucb structure
0000   161 ;
0000   162 ;       V03-004 MIR0011         Michael I. Rosenblum            18-Nov-1982
0000   163 ;               Remove code that implimented HOLDSCREEN.
0000   164 ;
0000   165 ;       V03-003 MIR0010         Michael I Rosenblum     09-Nov-1982
0000   166 ;               Move the address of the terminator mask, and the length
0000   167 ;               of the prompt string from the IRP into the terminal read
0000   168 ;               buffer.
0000   169 ;
0000   170 ;       V03-002 ROW0077         Ralph O. Weber          27-MAR-1982
0000   171 ;               Change TTY$WRITEDONE to insure that eventhough UCB$W_TT_CURSOR
```

```
0000   172 ;               can now be bigger than UCB$W_DEVBUFSIZ, i.e. eventhough our
0000   173 ;               internal cursor position marker can virtually be beyond the
0000   174 ;               right-hand edge of the screen, the cursor-position value
0000   175 ;               returned in IOSB will never exceed the width of the screen.
0000   176 ;
0000   177 ;       V03-001 JLV0202         Jake VanNoy             23-MAR-1982
0000   178 ;               Change MODHANGUP from NOMOD to PRIV_TO_MOD in Set
0000   179 ;               Mode/Char logic.
0000   180 ;               Correct alternate class name lookup.
0000   181 ;
0000   182 ;       V02-045 RKS0045         RICK SPITZ              22-FEB-1982
0000   183 ;               Repair diagnostic function code logic.
0000   184 ;
0000   185 ;       V02-044 RKS0044         RICK SPITZ              16-FEB-1982
0000   186 ;               Enhance broadcast logic to allow delay prior to
0000   187 ;               forcing output. Move setting of controls pending
0000   188 ;               to STOP2 timeout. This way user ^s can be distinquished
0000   189 ;               from terminal xoff.
0000   190 ;               Save R3 prior to forking to create typeahead on read.
0000   191 ;
0000   192 ;       V02-043 RKS0043         RICK SPITZ              11-FEB-1982
0000   193 ;               Zero fork byte in TWP to allow DMA of broadcast.
0000   194 ;               Prevent XON characteristic from being permantly set.
0000   195 ;
0000   196 ;       V02-042 RKS0042         Rick Spitz              8-FEB-1982
0000   197 ;               Repair Alternate typeahead logic to allow setting
0000   198 ;               Permanent from users terminal.
0000   199 ;               Allocate typeahead buffer when starting read, if not already
0000   200 ;               done. This is needed for lines which are used for communications
0000   201 ;               on DMF-32 async lines.
0000   202 ;
0000   203 ;       V02-041 ROW0066         Ralph O. Weber          31-JAN-1982
0000   204 ;               Enhance alternate class driver setup to relocate address in
0000   205 ;               alternate class driver vector table.  Correct use of
0000   206 ;               unrelocateable .ASCID directive.
0000   207 ;
0000   208 ;       V02-040 RKS0040         RICK SPITZ              24-JAN-1982
0000   209 ;               USE INPUT VALUE FOR READ FIELD OFFSET.
0000   210 ;               ADD LOGIC TO BIND TO ALTERNATE DRIVER.
0000   211 ;
0000   212 ;       V02-039 RKS0039         RICK SPITZ              15-DEC-1981
0000   213 ;               FIX MAINTENANCE DISPATCH LOGIC.
0000   214 ;               DISALLOW SETTING ALT TYPEAHEAD IF ONE ALREAY EXISTS.
0000   215 ;               REMOVE LOGIO REQUIREMENT FOR PARITY ENABLE.
0000   216 ;               FIX WRTSTARTIO RETURN ADDRESSING.
0000   217 ;               ALLOW NOECHO READ TO NOT BLOCK WRITES.
0000   218 ;               ADD WRITE POST ROUTINE TO REPLACE INSPOST LOGIC, THIS
0000   219 ;               CORRECTS RACE CONDITION IN HALF DUPLEX WRITE COMPLETIONS.
0000   220 ;               ADD SUPPORT FOR ALTERNATE CLASS DRIVER.
0000   221 ;
0000   222 ;       V02-038 JLV0126         Jake VanNoy             1-Dec-1981
0000   223 ;               Add local echo logic and set speed privilege checking.
0000   224 ;
0000   225 ;       V02-037 JLV0102         Jake VanNoy             27-Oct-1981
0000   226 ;               Changed TTYDEFS to $TTYDEFS.
0000   227 ;
0000   228 ;       V02-036 JLV0070         Jake VanNoy                     28-Aug-1981
```

```
0000   229 ;                   Added UCB$L_TT_DEVDP1 checking and no refresh on broadcast.
0000   230 ;
0000   231 ;       V02-035 RKS035          RICK SPITZ                      26-AUG-1981
0000   232 ;               ADD MAINT ENABLE BIT
0000   233 ;
0000   234 ;       V02-034 RKS034          RICK SPITZ                      20-AUG-1981
0000   235 ;               ADD SUPPORT FOR ESCAPE MODIFIER ON READ.
0000   236 ;
0000   237 ;       V02-033 RKS033          RICK SPITZ                      12-AUG-1981
0000   238 ;               RESET DMA ABORT STATE IN WRITE DONE LOGIC.
0000   239 ;               RESET CONTROLS STATE FOR MAINTENANCE FUNCTIONS.
0000   240 ;
0000   241 ;       V02-032 RKS032          RICK SPITZ                      27-JULY-1981
0000   242 ;               SEVERAL ENHANCEMENTS HAVE BEEN ADDED TO SUPPORT REVISIONS
0000   243 ;               TO THE UCB STRUCTURE INCLUDING SPLIT SPEED, AND QUADWORD STATE
0000   244 ;               AND DEVDEPEND FIELDS.
0000   245 ;               SUPPORT FOR DIAGNOSTIC FUNCTIONS AND ENHANCED MODEM PROCESSING
0000   246 ;               HAS BEEN ADDED. SEVERAL CHANGES TO SUPPORT THE CLASS/PORT
0000   247 ;               STRUCTURE AS WELL AS ENHANCEMENTS TO ALLOW TERMINAL
0000   248 ;               INITIATED CONTROL S AND Q DURING BROADCAST HAVE ALSO BEEN
0000   249 ;               ADDED.
0000   250 ;
0000   251 ;       V02-031 RKS031          RICK SPITZ                      26-FEB-1981
0000   252 ;               REMOVE V2.0 AUDIT TRAILS
0000   253 ;
```

```
                        .SBTTL  Declarations
                ;
                ; EXTERNAL SYMBOLS
                ;
                        $ARBDEF                         ; DEFINE ACCESS RIGHTS BLOCK
                ;       $CADEF                          ; DEFINE CONDITIONAL ASSEMBLY PARAMETERS.
                        $CRBDEF                         ; DEFINE CRB
                        $DPTDEF                         ; DEFINE DPT OFFSETS
                        $IODEF                          ; DEFINE I/O FUNCTION CODES
                        $IPLDEF                         ; DEFINE IPL'S
                        $IRPDEF                         ; DEFINE IRP
                        $PRDEF                          ; DEFINE PROCESSOR REGISTERS
                        $PRVDEF                         ; DEFINE PRIVILEGE MASK BITS
                        $SSDEF                          ; Define system status codes
                        $TTDEF                          ; DEFINE TERMINAL CHARACTERISTICS
                        $TT2DEF                         ; DEFINE TERMINAL CHARACTERISTICS
                        $TTYDEF                         ; DEFINE TERMINAL DRIVER SYMBOLS
                        $UCBDEF                         ; DEFINE UCB
                        $VECDEF                         ; DEFINE CRB VECTOR OFFSETS
                        $TTYMACS                        ; DEFINE TERMINAL MACROS
                        $TTYDEFS                        ; DEFINE TERMINAL DEFINITIONS
                        $TTYMODEM                       ; DEFINE TERMINAL MODEM DEFINITIONS

00000000                .PSECT  $$$115_DRIVER,LONG      ; DEFINE NON-PAGED PSECT
```

```
                                0000   281          .SBTTL  TTY$STARTIO - START I/O OPERATION ON TERMINAL
                                0000   282 ;++
                                0000   283 ; TTY$STARTIO - START I/O OPERATION ON TERMINAL
                                0000   284 ;
                                0000   285 ; FUNCTIONAL DESCRIPTION:
                                0000   286 ;
                                0000   287 ; THIS ROUTINE IS ENTERED WHEN THE UNIT IS IDLE AND THERE IS A PACKET TO PROCESS.
                                0000   288 ;
                                0000   289 ; INPUTS:
                                0000   290 ;
                                0000   291 ;       I/O PACKET FORMATTED AS DESCRIBED IN TTYFDT.
                                0000   292 ;
                                0000   293 ;       R3 = I/O PACKET ADDRESS
                                0000   294 ;       R5 = LOGICAL UCB ADDRESS
                                0000   295 ;
                                0000   296 ; OUTPUTS:
                                0000   297 ;
                                0000   298 ;       NONE
                                0000   299 ;--
                                0000   300 TTY$STARTIO::                             ; START TERMINAL I/O
                                0000   301
                                0000   302 ;       MOVE TO PHYSICAL UCB CONTEXT. THIS INVOLVES DUPLICATING
                                0000   303 ;       MANIPULATIONS TO THE LOGICAL UCB DONE BY IOC$INITIATE
                                0000   304
          50    00A0 C5    D0   0000   305          MOVL    UCB$L_TL_PHYUCB(R5),R0  ; GET PHYSICAL UCB ADDRESS
             58 A0    53    D0   0005   306          MOVL    R3,UCB$L_IRP(R0)        ; COPY IRP ADDRESS TO PHYS UCB
          78 A0    2C A3    7D   0009   307          MOVQ    IRP$L_SVAPTE(R3),UCB$L_SVAPTE(R0)
       64 A0    0048 8F    AA   000E   308          BICW    #UCB$M_CANCEL!UCB$M_TIMOUT,UCB$W_STS(R0)
                55    50    D0   0014   309          MOVL    R0,R5                   ; SWITCH TO PHYSICAL UCB
                                0017   310
                    FFE6'   30   0017   311          BSBW    TTY$LOCK                ; SETUP IPL AND REGISTERS
54    20 A3    FFC0 8F    AB   001A   312          BICW3   #^C<IO$M_FCODE>,IRP$W_FUNC(R3),R4; GET INTERNAL FUNCTION CODE
                                0021   313          CASE    R4,TYPE=B,<DO_READ,DO_WRITE,DO_SETM,DO_SETC,DO_HANGUP,-
                                0021   314                  DO_MAINT,DO_HANGUP,DO_CONNECT,DO_DISCONNECT>
                                0037   315
```

```
                                0037   317          .sbttl  START_IO ACTION ROUTINES
                                0037   318
                                0037   319 ;       CONNECT THIS PUCB TO A DETACHED LUCB
                                0037   320
                                0037   321 DO_CONNECT:
                          0C    E1    0037   322          BBC     #IO$V_TT_DISCON,-
                       08 20    A3    0039   323              IRP$W_FUNC(R3),10$          ;SKIP UNLESS DISCONNECT SPECIFIED
                48 A5   00020000 8F    CA    003C   324          BICL    #TT2$M_DISCONNECT,UCB$L_DEVDEPND2(R5); FORCE HANGUP TO COMMAND PROCE
                                0044   325 10$:
                51      0084    C5    D0    0044   326          MOVL    UCB$L_PDT(R5),R1            ; GET TARGET LUCB ADDRESS
                                51    13    0049   327          BEQL    25$                         ; NONE, MUST BE JUST DELETED
                                      0048   328
                                      0048   329          SET_STATE       RECONNECT               ; SET RECONNECT STATE TO TARGET LUCB
                                      004F   330
                                0A    BB    004F   331          PUSHR   #^M<R1,R3>                  ; SAVE IRP ADDRESS AND LUCB
                             54   02    D0    0051   332          MOVL    #TTY$V_FD_DISCONNECT,R4     ; SCHEDULE DISCONNECT COMMAND PUCB
                                FFA9'   30    0054   333          BSBW    TTY$CRE_FORK
                                0A    BA    0057   334          POPR    #^M<R1,R3>                  ; SAVE IRP ADDRESS AND LUCB
                                      0059   335
                                      0059   336 ;       NOW CONVERT IRP INTO SET MODE AND FILL IN VALUES FROM
                                      0059   337 ;       THE TARGET LUCB
                                      0059   338
                40 A3     44 A1     7D    0059   339          MOVQ    UCB$L_DEVDEPEND(R1),IRP$Q_TT_STATE(R3)
                39 A3     41 A1     90    005E   340          MOVB    UCB$B_DEVTYPE(R1),IRP$L_MEDIA+1(R3)     ; TERMINAL TYPE
                3A A3     42 A1     B0    0063   341          MOVW    UCB$W_DEVBUFSIZ(R1),IRP$L_MEDIA+2(R3)   ; WIDTH
                             4C A3    D4    0068   342          CLRL    IRP$W_TT_PRMPT(R3)
                          009C C3     D4    0068   343          CLRL    IRP$L_VAL5(R3)
                                      006F   344
                40 A3     00200000 8F    CA    006F   345          BICL    #TT$M_MODEM,IRP$Q_TT_STATE(R3)          ; TRACK MODEM TO BE SAME AS
                   08 44 A5    15    E1    0077   346          BBC     #TT$V_MODEM,UCB$L_DEVDEPEND(R5),20$     ;
                40 A3     00200000 8F    C8    007C   347          BISL    #TT$M_MODEM,IRP$Q_TT_STATE(R3)          ;
                                      0084   348 20$:
                44 A3     00020000 8F    CA    0084   349          BICL    #TT2$M_DISCONNECT,IRP$Q_TT_STATE+4(R3)  ; TRACK DISCONNECT TO BE SAM
                   08 48 A5    11    E1    008C   350          BBC     #TT2$V_DISCONNECT,UCB$L_DEVDEPND2(R5),22$;
                44 A3     00020000 8F    C8    0091   351          BISL    #TT2$M_DISCONNECT,IRP$Q_TT_STATE+4(R3)  ;
                                      0099   352 22$:
                                      0099   353
                                      0099   354
                             0125     31    0099   355          BRW     DO_SET                      ; NOW INVOKE SET MODE ACTION ROUTINE
                                      009C   356
                      50    0908 8F    3C    009C   357 25$:     MOVZWL  #SS$_NOSUCHDEV,R0           ; INDICATE DEVICE NOT AVAILABLE
                             0691     31    00A1   358          BRW     TTY$DONE
```

```
                        00A4    360
                        00A4    361
                        00A4    362 ;       DISCONNECT COMMAND LUCB FROM PUCB.
                        00A4    363 ;       IF NOT DETACHED, HANGUP SIGNALED TO COMMAND PROCESS
                        00A4    364
                        00A4    365 DO_DISCONNECT:
          53    DD      00A4    366         PUSHL   R3                              ; SAVE IRP
    54    02    D0      00A6    367         MOVL    #TTY$V_FD_DISCONNECT,R4         ; SCHEDULE DISCONNECT ON THAT PUCB
      FF54'   30      00A9    368         BSBW    TTY$CRE_FORK
          53  8ED0     00AC    369         POPL    R3                              ; RESTORE IRP
    50    01    3C      00AF    370         MOVZWL  #SS$_NORMAL,R0
        0680    31      00B2    371         BRW     TTY$DONE
```

```
                        00B5   373
                        00B5   374
                        00B5   375 ;       PROCESS HANGUP FUNCTION. THIS ROUTINE FORCES A MODEM HANGUP
                        00B5   376
                        00B5   377 DO_HANGUP:
      38   BB           00B5   378          PUSHR   #^M<R3,R4,R5>           ; SAVE REGISTERS
  FF46'    30           00B7   379          BSBW    CLASS_MODEM_DIS         ; DISCONNECT UNIT
      38   BA           00BA   380          POPR    #^M<R3,R4,R5>           ; RESTORE REGITERS
    0363   31           00BC   381          BRW     DO_EXIT
                        00BF   382
```

```
                          00BF    384
                          00BF    385 ;       PROCESS MAINTENANCE FUNCTIONS
                          00BF    386
                          00BF    387 DO_MAINT:
            15    E0      00BF    388             BBS     #TT$V_MODEM,-                   ; DISALLOW IF MODEM LINE
                                                          UCB$L_DEVDEPEND(R5),30$
        41 44 A5          00C1    389
    54   0118 C5    D0    00C4    390             MOVL    UCB$L_TT_PORT(R5),R4            ; ACCESS PORT VECTOR
              04    E0    00C9    391             BBS     #IO$V_SET_MODEM,-               ; BRANCH IF SET MODEM FUNCTION
           24 20 A3         00CB    392                     IRP$W_FUNC(R3),20$
            06    07    EF  00CE    393             EXTZV   #IO$V_LOOP,#<IO$V_LOOP_EXT-IO$V_LOOP+1>,-
        50    20 A3         00D1    394                     IRP$W_FUNC(R3),R0               ; GET MAINT SUBMODIFIERS
    012A C5    50    88     00D4    395             BISB    R0,UCB$B_TT_MAINT(R5)           ; PASS TO PORT
               50    D4     00D9    396             CLRL    R0                              ; ASSUME ERROR, FOR NULL POST ROUTIN
             FF22'   30     00DB    397             BSBW    TTY$MAINT                       ; INVOKE PORT DRIVER TO DO FUNCTION
            7F 8F    8A     00DE    398             BICB    #^C<UCB$M_TT_DSBL>,-            ; RESET ALL BUT DISABLE
          012A C5           00E1    399                     UCB$B_TT_MAINT(R5)
            1E 50    E9     00E4    400             BLBC    R0,30$                          ; FAILURE
    50   0118 C5    D0     00E7    401             MOVL    UCB$L_TT_PORT(R5),R0            ; GET PORT VECTOR ADDRESS
             FF11'   30     00EC    402             BSBW    TTY$RESUME                      ; RESET ANY CONTROLS STATE
              0330   31     00EF    403             BRW     DO_EXIT                         ; SUCCESS
                          00F2    404 20$:                                                ; PROCESS SET MODEM SIGNALS
        52   3A A3    3C    00F2    405             MOVZWL  IRP$L_MEDIA+2(R3),R2            ; GET SET/RESET MODEM MASK
        52   E5 BF    8A    00F6    406             BICB    #^C<TT$M_DS_DTR!-               ; CLEAR ALL BUT MODEM OUTPUT
                          00FA    407                     TT$M_DS_SECTX!-                 ; BITS
                          00FA    408                     TT$M_DS_RTS>,R2
               53    DD     00FA    409             PUSHL   R3                              ; SAVE VOLITAL REGISTER
             FF01'   30     00FC    410             BSBW    TTY$DS_SET                      ; SET /RESET SPECIFIED SIGNALS
               53 8ED0      00FF    411             POPL    R3                              ; RESTORE REGISTER
              031D   31     0102    412             BRW     DO_EXIT                         ; SUCCESS EXIT
                          0105    413 30$:
        50    2C    3C      0105    414             MOVZWL  #SS$_ABORT,R0                   ; ERROR EXIT
               51    D4     0108    415             CLRL    R1
              0628   31     010A    416             BRW     TTY$DONE
```

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                                                ;
                                ; READ OPERATION
                                ;
                                DO_READ:                                        ;
54   78 A5   D0                        MOVL    UCB$L_SVAPTE(R5),R4         ; GET THE ADDRESS OF THE READ PACKET
                                ;
62   40 A3   C8                        BISL    IRP$Q_TT_STATE(R3),(R2)     ; Set the read state bits.
04 A2   44 A3   C8                     BISL    IRP$Q_TT_STATE+4(R3),4(R2)
                                ;
      38 A3   D4                        CLRL    IRP$L_MEDIA(R3)             ; Set up storage for the read
                                                                            ; terminator.
        04   AA                         BICW    #UCB$M_TT_NOTIF,-           ; Set the "user has not been
      68 A5                                     UCB$W_DEVSTS(R5)            ; notified" bit.
        0B   E1                         BBC     #IO$V_PURGE,-               ; Branch forward if purge type-
   03 20 A3                                     IRP$W_FUNC(R3),10$          ; ahead not requested.
       FED7'  30                        BSBW    TTY$PURGE_AHEAD             ; Otherwise, purge buffer.
                                                                            ; the write completes.
                                10$:
    00E4 C5   D5                        TSTL    UCB$L_TT_TYPAHD(R5)         ; Type ahead buffer allocated?
        73   13                         BEQL    30$                         ; Not yet
                                12$:    BSBW    TTY$SETUP_READ              ; Set up the UCB for a read
                                                                            ; operation.
                                ;
                                ; CHECK FOR LINE FEED NEEDED
                                ;
                                ;
                                        IF_STATE -                          ; Skip if passall, or
                                        <PASALL>,25$
                                        IF_NOT_STATE NOECHO,14$             ; NO ECHO THEN
                                        CLR_STATE EDITING                   ; NO EDITING
                                14$:    IF_STATE -
                                        <NL,WRAP>,20$                       ; if already did line feed.
                                ;
                                        IF_NOT_STATE NOECHO,15$             ; Branch if echo
        00   E1                 BBC     #TT2$V_LOCALECHO,-                  ; Branch if not local echo
     26 48 A5                           UCB$L_DEVDEPND2(R5),20$
                                ;
    00FC C5   B5                15$:    TSTW    UCB$W_TT_CURSOR(R5)         ; CURSOR AT 0?
        20   12                 BNEQ    20$                                 ; If no, send no line feed.
    00FF C5   91                CMPB    UCB$B_TT_LASTC(R5),-                ; Was the last character also a
        0D                              #TTY$C_CR                           ; carriage return?
        19   12                 BNEQ    20$                                 ; No. Don't send free linefeed.
                                        IF_NOT_STATE SKIPLF,17$             ; NO SKIP LINEFEED THEN BYPASS NOCRLF CHECK
OF 0122 C5   07   E0            BBS     #TTY$V_PC_NOCRLF,UCB$W_TT_PRTCTL(R5),20$;SO JUST ECHO THE CHARACTER
                                17$:    SET_STATE <SENDLF>                  ; SEND A LINE FEED FIRST
                                        CLR_STATE <SKIPLF>
                                        IF_NOT_STATE PROMPT,20$             ; DO WE HAVE A
                                        SET_STATE <SKIPLF>                  ; SEND A LINE FEED FIRST
                                20$:    IF_STATE RDVERIFY,25$               ; THIS ISN'T NECESSARY IF READ VERIFY
                                ;
      54   78 A5   D0                  MOVL    UCB$L_SVAPTE(R5),R4         ; GET THE READ PACKET ADDRESS
   7E   00FC C5   3C                   MOVZWL  UCB$W_TT_CURSOR(R5),-(SP)   ; SAVE THE CURSOR POSITION FOR ECHOING
     02   44 A4   B1                  CMPW    TTY$W_RB_MODE(R4),#TTY$K_ER ECHLINE; IS THIS A READ WITH INITIAL
                                                                            ; OFFSET.
             0D   12                    BNEQ    21$                         ; NO THEN USE NORMAL
```

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                                                L 6
00FC C5   012B C5   9B  0187   475          MOVZBW  UCB$B_TT_OLDCPZORG(R5),UCB$W_TT_CURSOR(R5); YES THEN USE THE
                        018E   476                                             ; STORED INITIAL CURSOR POSITION
  3A A4   012B C5   9B  018E   477          MOVZBW  UCB$B_TT_OLDCPZORG(R5),TTY$W_RB_CPZORG(R4);
            32 A4   B4  0194   478 21$:     CLRW    TTY$W_RB_LINREST(R4)    ; NO EXTRA CHARACTERS
          FE66'     30  0197   479          BSBW    FIND_BOL_NOCLEAR        ; find the wrapping and
      00FC C5   8E    F7  019A   480          rVTLW   (SP)+,UCB$W_TT_CURSOR(R5); RESTORE THE CURSOR POSITION FOR ECHOING
            0390    31  019F   481 25$:     BRW     TTY$STARTOUTPUT         ; Go start the read.
                        01A2   482 30$:
                        01A2   483          ; Allocate typeahead buffer
                        01A2   484
              53    DD  01A2   485          PUSHL   R3                      ; SAVE IRP ADDRESS
              53    D4  01A4   486          CLRL    R3                      ; INDICATE NO DATA
            54  01    D0  01A6   487          MOVL    #TTY$V_FD_GETAHD,R4     ; ASK FOR TYPEAHD FORK
          FE54'     30  01A9   488          BSBW    TTY$CRE_FORK            ; GO ALLOCATE BUFFER
              53 8ED0   01AC   489          POPL    R3                      ; RESTORE IRP ADDRESS
            FF7D    31  01AF   490          BRW     12$                     ; CONTINUE PROCESSING
                        01B2   491
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                                                M 6
                                01B2    493
                                01B2    494 ; SET MODE OPERATION -
                                01B2    495
                                01B2    496 DO_SETM:
                        000C     31     01B2    497             BRW     DO_SET
                                01B5    498
                                01B5    499 ; DO SET CHARACTERISTICS
                                01B5    500
                                01B5    501 DO_SETC:                                    ; DO PRIVILEGED SET
                    32 A3        0C     01B5    502             CMPW    #12,IRP$W_BCNT(R3)      ; CHECK PARAMETERS
                                 06     01B9    503             BLEQ    DO_SET                  ; ALL SPECIFIED
                       00C8 C5   D0     01BB    504             MOVL    UCB$L_TT_DECHA1(R5),-   ; INIT DEFAULT IF NOT SPECIFIED
                          44 A3          01BF    505                     IRP$Q_TT_STATE+4(R3)
                                01C1    506
                                01C1    507 ; PROCESS CHANGE OF CHARACTERISTICS AND MODE
                                01C1    508 ; CHANGE BASIC MODE BITS IN UCB$L_DEVDEPEND
                                01C1    509
                                01C1    510 DO_SET:
             54    44 A5    40 A3    CD  01C1    511             XORL3   IRP$Q_TT_STATE(R3),UCB$L_DEVDEPEND(R5),R4; GET MODIFIED BITS
                   08 54       0D    E5  01C7    512             BBCC    #TT$V_REMOTE,R4,8$      ; DISALLOW CLEARING REMOTE BIT
                40 A3   00002000 8F    CA  01CB    513             BICL    #TT$M_REMOTE,IRP$Q_TT_STATE(R3)
                                01D3    514                                             ; DISALLOW SETTING REMOTE BIT
                                01D3    515 8$:
                   44 A5       54    CA  01D3    516             BICL    R4,UCB$L_DEVDEPEND(R5)  ; CLEAR THE CHANGED BITS
                44 A5          40 A3    C8  01D7    517             BISL    IRP$Q_TT_STATE(R3),UCB$L_DEVDEPEND(R5);
                41 A5          39 A3    90  01DC    518             MOVB    IRP$L_MEDIA+1(R3),UCB$B_DEVTYPE(R5); INSERT NEW TERMINAL TYPE
                                01E1    519 ;
                                01E1    520 ;       DEVDP1 BIT CHECKING
                                01E1    521 ;
                   50    44 A3    D0  01E1    522             MOVL    IRP$Q_TT_STATE+4(R3),R0 ; GET SECOND DEVDEPEND WORD
             51    48 A5       50    CD  01E5    523             XORL3   R0,UCB$L_DEVDEPND2(R5),R1 ; GET MODIFIED BITS
          50    00000200 8F    CA  01EA    524             BICL    #<TT2$M_DCL_MAILBX>,R0  ; REMOVE DCL SPECIFIC BITS
                                01F1    525
                   24 51       06    E1  01F1    526             BBC     #TT2$V_DMA,R1,12$       ; SKIP IF DMA NOT CHANGED
                   14 50       06    E1  01F5    527             BBC     #TT2$V_DMA,R0,10$       ; BRANCH IF TURNING DMA OFF
             0E D122 C5        02    E1  01F9    528             BBC     #TTY$V_PC_DMAAVL,UCB$W_TT_PRTCTL(R5),10$ ; DONT IF FEATURE NOT AVAIL
          50    00000040 8F    C8  01FF    529             BISL    #TT2$M_DMA,R0           ; SET DMA CHARACTERISTIC ON
                0122 C5        02    A8  0206    530             BISW    #TTY$M_PC_DMAENA,UCB$W_TT_PRTCTL(R5) ; ENABLE IN PORT
                               0C    11  020B    531             BRB     12$
                0122 C5        02    AA  020D    532 10$:        BICW    #TTY$M_PC_DMAENA,UCB$W_TT_PRTCTL(R5) ; DISABLE DMA IN PORT
          50    00000040 8F    CA  0212    533             BICL    #TT2$M_DMA,R0           ; RESET DMA CHARACTERISTIC
                                0219    534
                                0219    535 12$:        NOMOD   ALTYPEAHD               ; DISALLOW CHANGING TYPE AHEAD
                                0224    536
                               03    E0  0224    537             BBS     #TT2$V_MODHANGUP,-
                      11 48 A5          0226    538                     UCB$L_DEVDEPND2(R5),15$ ; BRANCH IF MODIFY HANGUP ALLOWED
                                0229    539
                                0229    540             PRIV_TO_MOD HANGUP              ; REQUIRE PRIV TO MODIFY HANGUP
                                023A    541 15$:        PRIV_TO_MOD SETSPEED            ; REQUIRE PRIV TO MODIFY SET SPEED
                                024B    542             PRIV_TO_MOD SECURE              ; REQUIRE PRIVS TO MODIFY SECURE SERVER
                                025C    543             PRIV_TO_MOD MODHANGUP           ; REQUIRE PRIV TO MODIFY MODHANGUP
                                026D    544
                06 50          05    E1  026D    545             BBC     #TT2$V_XON,R0,20$       ; BRANCH IF NO XON REQUESTED
                   50          20    CA  0271    546             BICL    #TT2$M_XON,R0           ; RESET XON BIT.
                         FD89'     30    0274    547             BSBW    TTY$RESUME              ; CALL RESUME
                                0277    548
                                0277    549 20$:
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                48 A5    50    D0  0277    550          MOVL    R0,UCB$L_DEVDEPND2(R5) ; SET SECOND DEVDEPENDENT WORD
                                   027B    551 ;
                                   027B    552 ; SET UP WIDTH
                                   027B    553 ;
              42 A5    3A A3    B0  027B    554          MOVW    IRP$L_MEDIA+2(R3),UCB$W_DEVBUFSIZ(R5); INSERT NEW CARRIAGE WIDTH
                                   0280    555 ;
                                   0280    556 ; SET UP SPEED
                                   0280    557 ;
                51    4C A3    3C  0280    558          MOVZWL  IRP$W_TT_PRMPT(R3),R1   ; GET NEW SPEED
                         1E    13  0284    559          BEQL    30$                     ; IF EQL THEN NO CHANGE
                                   0286    560 ;
                                   0286    561 ; SET SPEED PRIVILEGE CHECK
                                   0286    562 ;
            00F4 C5     51    91  0286    563          CMPB    R1,UCB$W_TT_SPEED(R5)   ; IS LOW ORDER BYTE OF SPEED CHANGING?
                         12    13  028B    564          BEQL    28$                     ; BRANCH IF NOT
                                   028D    565
                         08    E1  028D    566          BBC     #TT2$V_SETSPEED,-
                      0D 48 A5       028F    567          UCB$L_DEVDEPND2(R5),28$ ; BRANCH IF SET SPEED ALLOWED
          58 B3   00400080 8F    D3  0292    568          BITL    #<<1@PRV$V_LOG_IO>! -   ; DOES PROCESS HAVE LOG_IO
                                   029A    569          <1@PRV$V_PHY_IO>>, -    ; OR PHY_IO PRIVILEGE?
                                   029A    570          @IRP$L_ARB(R3)          ; CHECK ACCESS RIGHTS BLOCK
                         03    12  029A    571          BNEQ    28$                     ; BRANCH IF PRIVILEGED
                       019D    31  029C    572          BRW     NOPRIV_EXIT             ; PRIV FAILURE
                                   029F    573
                                   029F    574 ;
                                   029F    575 ; PROCESS PARITY SETTINGS
                                   029F    576 ;
            00F4 C5     51    B0  029F    577 28$:     MOVW    R1,UCB$W_TT_SPEED(R5)   ; INSERT LINE SPEED
        12  009C C3     05    E1  02A4    578 30$:     BBC     #TT$V_ALTPAR,IRP$L_VAL5(R3),35$; BR IF PARITY SHOULD NOT BE ALTERED
    50      009C C3     3F 8F    8B  02AA    579          BICB3   #^C<TT$M_PARITY!TT$M_ODD>,IRP$L_VAL5(R3),R0; RESET BITS
            00F8 C5     C0 8F    8A  02B1    580          BICB    #TT$M_PARITY!TT$M_ODD,UCB$B_TT_PARITY(R5); CLEAR CURRENT PARITY
               00F8 C5     50    88  02B7    581          BISB    R0,UCB$B_TT_PARITY(R5)  ; INSERT NEW VALUE
                                   02BC    582 ;
                                   02BC    583 ; SET UP CHARACTER SIZE AND STOP BITS
                                   02BC    584 ;
                                   02BC    585 35$:
        08 009C C3     04    E0  02BC    586          BBS     #TT$V_ALTFRAME,IRP$L_VAL5(R3),36$; DOES THE USER WANT A NEW FRPAM SI
        21 00F8 C5     02    E1  02C2    587          BBC     #UCB$V_TT_USERFRAME,UCB$B_TT_PARITY(R5),37$; DID THE USER SPECIFY
                                   02C8    588                                          ; THE FRAME SIZE?
                         3B    11  02C8    589          BRB     42$                     ; YES THEN DON'T BOTHER IT
        00 00F8 C5     02    E5  02CA    590 36$:     BBCC    #UCB$V_TT_USERFRAME,UCB$B_TT_PARITY(R5),38$
50   009C C3   FFFFFFF0 8F    CB  02D0    591 38$:     BICL3   #^C<^X0F>,IRP$L_VAL5(R3),R0; GET THE NEW FRAME SIZE
                         0D    13  02DA    592          BEQL    37$                     ; 0 SPECIFYED THEN CLEAR USER FRAME
    00F8 C5     02    03    50  F0  02DC    593          INSV    R0,#UCB$V_TT_LEN,#2,UCB$B_TT_PARITY(R5); SET THE
                                   02E3    594                                          ; PARITY CORRECTLY
            1C 00F8 C5     02    E3  02E3    595          BBCS    #UCB$V_TT_USERFRAME,UCB$B_TT_PARITY(R5),42$; AND SETUSER FRAME
                                   02E9    596                                          ; SPECIFYED THEN CONTINUE ON
                         06    E1  02E9    597 37$:     BBC     #TT$V_PARITY,-
                   11 00F8 C5           02EB    598          UCB$B_TT_PARITY(R5),40$ ; IF NO PARITY, USE 8 BIT
                         0F    E0  02EF    599          BBS     #TT$V_EIGHTBIT,-
                      0C 44 A5       02F1    600          UCB$L_DEVDEPND(R5),40$ ; USE 8 BIT SIZE
               00F8 C5     18    8A  02F4    601          BICB    #UCB$M_TT_LEN,UCB$B_TT_PARITY(R5)       ; RESET CHARACTER FRAME
               00F8 C5     10    88  02F9    602          BISB    #^X10,UCB$B_TT_PARITY(R5)       ; SET 7 BIT CHARACTER FRAME
                         05    11  02FE    603          BRB     42$
                                   0300    604 40$:
               00F8 C5     18    88  0300    605          BISB    #UCB$M_TT_LEN,UCB$B_TT_PARITY(R5)       ; SET 8 BIT CHARACTER FRAME
                                   0305    606 42$:
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                11 009C C3    0A    E1  0305    607          BBC     #TT$V_ALTDISPAR,IRP$L_VAL5(R3),41$      ; CHECK FOR DISABLE PARITY E
                   00F8 C5    02    CA  030B    608          BICL    #UCB$M_TT_DISPARERR,UCB$B_TT_PARITY(R5) ; CLEAR DISMISS
                06 009C C3    09    E1  0310    609          BBC     #TT$V_DISPARERR,IRP$L_VAL5(R3),41$      ; DOES HE WANT IT SET
                00 00F8 C5    01    E2  0316    610          BBSS    #UCB$V_TT_DISPARERR,UCB$B_TT_PARITY(R5),41$; YES THEN SET IT
                07 009C C3    08    E0  031C    611 41$:     BBS     #TT$V_TWOSTOP,IRP$L_VAL5(R3),43$        ; DOES HE WANT TWO STOP BITS
                   04   00F4 C5    91  0322    612          CMPB    UCB$W_TT_SPEED(R5),#4                   ; SPEED <= 150 BAUD?
                                07    14  0327    613          BGTR    44$                                     ; NO
                   00F8 C5      20    88  0329    614 43$:     BISB    #UCB$M_TT_STOP,UCB$B_TT_PARITY(R5)      ; FLAG 2 STOP BITS
                                05    11  032E    615          BRB     46$
                                          0330    616 44$:
                   00F8 C5      20    8A  0330    617          BICB    #UCB$M_TT_STOP,UCB$B_TT_PARITY(R5)      ; FLAG 1 STOP BIT
                                          0335    618 ;
                                          0335    619 ; PROCESS FILL DATA
                                          0335    620 ;
                                          0335    621 46$:
                                50    D4  0335    622          CLRL    R0                              ; ASSUME NEW VALUE IS 0
                CA 44 A5        0A    E1  0337    623          BBC     #TT$V_CRFILL,UCB$L_DEVDEPEND(R5),50$; CR FILL ON?
                   50     4E    A3    9A  033C    624          MOVZBL  IRP$W_TT_PRMPT+2(R3),R0 ; GET NEW VALUE
                   02 54        0A    E0  0340    625          BBS     #TT$V_CRFILL,R4,50$             ; CHANGE?
                                0C    13  0344    626          BEQL    60$                             ; IF NEQ EQL 0 THEN NO CHANGE
                   00F6 C5      50    90  0346    627 50$:     MOVB    R0,UCB$B_TT_CRFILL(R5)          ; RESET VALUE
                                05    12  034B    628          BNEQ    60$                             ; IF NEQ THEN OK
                00 44 A5        0A    E5  034D    629          BBCC    #TT$V_CRFILL,UCB$L_DEVDEPEND(R5),60$; SET OFF
                                50    D4  0352    630 60$:     CLRL    R0                              ; ASSUME NEW VALUE IS 0
                0A 44 A5        0B    E1  0354    631          BBC     #TT$V_LFFILL,UCB$L_DEVDEPEND(R5),65$; LF FILL ON?
                   50     4F    A3    9A  0359    632          MOVZBL  IRP$W_TT_PRMPT+3(R3),R0 ; GET NEW VALUE
                   02 54        0B    E0  035D    633          BBS     #TT$V_LFFILL,R4,65$             ; CHANGE?
                                0C    13  0361    634          BEQL    75$                             ; IF NEQ EQL 0 THEN NO CHANGE
                   00F7 C5      50    90  0363    635 65$:     MOVB    R0,UCB$B_TT_LFFILL(R5)          ; RESET VALUE
                                05    12  0368    636          BNEQ    75$                             ; IF NEQ THEN OK
                00 44 A5        0B    E5  036A    637          BBCC    #TT$V_LFFILL,UCB$L_DEVDEPEND(R5),75$; SET OFF
                                          036F    638 ;
                                          036F    639 ; CHECK FOR CHANGE IN STATUS OF MODEM
                                          036F    640 ;
                                          036F    641 75$:
                   12 54        15    E1  036F    642          BBC     #TT$V_MODEM,R4,80$              ; NO CHANGE IN MODEM STATUS
                                1F    BB  0373    643          PUSHR   #^M<R0,R1,R2,R3,R4>             ; SAVE VOLITAL REGISTERS
                      51        00    9A  0375    644          MOVZBL  #MODEM$C_INIT,R1                ; ASSUME MODEM INIT
                   44 A5        15    E0  0378    645          BBS     #TT$V_MODEM,UCB$L_DEVDEPEND(R5),-
                                03          037C    646                  77$                        ; IT IS INIT
                      51        01    9A  037D    647          MOVZBL  #MODEM$C_SHUTDWN,R1             ; NO, SHUT DOWN
                                          0380    648 77$:
                         FC7D'  30    0380    649          BSBW    TRANSITION_NOCHECK              ; DECLARE MODEM TRANSITION
                                1F    BA  0383    650          POPR    #^M<R0,R1,R2,R3,R4>
                                          0385    651
                                          0385    652 80$:
                                          0385    653 ;
                                          0385    654 ; enable or disable AUTO XON AND XOFF
                                          0385    655 ;
             0122 C5      0040 8F    A8  0385    656          BISW    #TTY$M_PC_XOFENA,UCB$W_TT_PRTCTL(R5); TURN ON AUTO XOFF
                05 44 A5        00    E0  038C    657          BBS     #TT$V_PASSALL,UCB$L_DEVDEPEND(R5),84$; IS THIS PASSALL? YES THEN
                07 44 A5        05    E0  0391    658          BBS     #TT$V_TTSYNC,UCB$L_DEVDEPEND(R5),85$; IF TT SYNC IS SET THEN LEAVE I
             0122 C5      0040 8F    AA  0396    659 84$:     BICW    #TTY$M_PC_XOFENA,UCB$W_TT_PRTCTL(R5); TURN OFF AUTO XOFF
                                          039D    660 85$:
                                          039D    661 ;
                                          039D    662 ; COPY OVER PASSALL AND NOECHO TO CURRENT STATE
                                          039D    663 ;
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                54   44 A5   FC 8F   BB  039D   664          BICB3   #^C<TT$M_PASSALL!TT$M_NOECHO>,UCB$L_DEVDEPEND(R5),R4
          04 A2    02    02   54   F0  03A3   665          INSV    R4,#TTY$V_ST_PASALL,#2,4(R2); INSERT IN STATE VECTOR
          54    44 A5    01   03   EE  03A9   666          EXTV    #TT$V_ESCAPE,#1,UCB$L_DEVDEPEND(R5),R4  ; GET CURRENT SETTING
          04 A2    01    0B   54   F0  03AF   667          INSV    R4,#TTY$V_ST_ESCAPE,#T,4(R2)            ; UPDATE IN STATE
                04 48 A5   12   E1  03B5   668          BBC     #TT2$V_PASTHRU,UCB$L_DEVDEPND2(R5),98$  ; IN PASS THRU MODE
                                    03BA   669          SET_STATE PASALL
                                    03BE   670 98$:
                                    03BE   671 ;
                                    03BE   672 ; INIT THE UNIT TO CHANGE THE SPEED AND PARITY
                                    03BE   673 ;
                          FC3F'     30  03BE   674          BSBW    TTY$SET_LINE                    ; INIT LINE SPEED AND PARITY
                                    03C1   675 ;
                                    03C1   676 ; IF MULTI IS SET THEN THE I/O MUST BE STARTED
                                    03C1   677 ;
                                    03C1   678 100$:   IF_NOT_STATE MULTI,110$                 ; BR IF MULTI NO SET
                          016A      30  03C5   679          BSBW    TTY$STARTOUTPUT                 ; START THE MULTIPLE OUTPUT
                                    03C8   680 ;
                                    03C8   681 ; CHECK FOR SET CHARACTERISTICS AND RETURN IOSB DATA
                                    03C8   682 ;
                      53    58 A5   D0  03C8   683 110$:   MOVL    UCB$L_IRP(R5),R3                ; GET CURRENT PACKET ADDRESS
          03    20 A3    06   00   ED  03CC   684          CMPZV   #IRP$V_FCODE,#IRP$S_FCODE,IRP$W_FUNC(R3),#TTY$C_FC_SETC; SET CHAR?
                                3A  12  03D2   685          BNEQ    120$                            ; IF NEQ THEN NO
             00E8 C5    00F4 C5   D0  03D4   686          MOVL    UCB$W_TT_SPEED(R5),UCB$W_TT_DESPEE(R5); RESET PERM SPEED
                                01  E1  03DB   687          BBC     #TT2$V_AUTOBAUD,-
                          05 48 A5      03DD   688                  UCB$L_DEVDEPND2(R5),115$ ; BRANCH IF NOAUTOBAUD
                                0F  9B  03E0   689          MOVZBW  #TT$C_BAUD_9600,-
                          00E8 C5       03E2   690                  UCB$W_TT_DESPEE(R5)      ; SET PERMANENT 9600 BAUD FOR AUTOBAUD
          . 00EC C5    00F8 C5   90  03E5   691 115$:   MOVB    UCB$B_TT_PARITY(R5),UCB$B_TT_DEPARI(R5); RESET PERM PARITY
             00F0 C5      41 A5   D0  03EC   692          MOVL    UCB$B_DEVTYPE(R5),UCB$B_TT_DETYPE(R5); RESET TYPE AND WIDTH
00C4 C5      44 A5    00002000 8F   CB  03F2   693          BICL3   #TT$M_REMOTE,UCB$L_DEVDEPND(R5),UCB$L_TT_DECHAR(R5); RESET PERM CHA
             00C8 C5      48 A5   D0  03FD   694          MOVL    UCB$L_DEVDEPND2(R5),UCB$L_TT_DECHA1(R5) ;UPDATE SECOND CHAR WORD
                                    0403   695
                06 44 A3    07   E1  0403   696          BBC     #TT2$V_ALTYPEAHD,IRP$Q_TT_STATE+4(R3),120$; SKIP IF ALTERNATE
                                    0408   697                                                  ; TYPEAHEAD NOT SPECIFIED
             00 00C8 C5     07   E2  0408   698          BBSS    #TT2$V_ALTYPEAHD,UCB$L_TT_DECHA1(R5),120$ ; ONLY ALLOW SETTING
                                    040E   699                                                  ; AS PERM CHARACTERISTIC
                                    040E   700 120$:
                                    040E   701
                                    040E   702 ;       UPDATE NEWLY WRITTEN FIELDS WHICH ARE MAINTAINED
                                    040E   703 ;       IN BOTH THE LOGICAL ANY PHYSICAL UCB
                                    040E   704
                 50    00C0 C5    D0  040E   705          MOVL    UCB$L_TT_LOGUCB(R5),R0                  ; GET LOGICAL UCB ADDRESS
              44 A0     44 A5    D0  0413   706          MOVL    UCB$L_DEVDEPEND(R5),UCB$L_DEVDEPEND(R0) ; UPDATE CHARACTERISTICS
              48 A0     48 A5    D0  0418   707          MOVL    UCB$L_DEVDEPND2(R5),UCB$L_DEVDEPND2(R0) ; "UCB$L_TT_DEVDP1"
              40 A0     40 A5    D0  041D   708          MOVL    UCB$B_DEVCLASS(R5),UCB$B_DEVCLASS(R0)   ; CLASS,TYPE,BUFSIZE
                                    0422   709
                                    0422   710 ;       THIS ROUTINE COMPLETES SET AND SENSE CHARACTERISTICS OPERATIONS
                                    0422   711 ;       AND RETURNS STATUS VALUES IN THE IOSB
                                    0422   712
                                    0422   713 DO_EXIT:
                 50    00F2 C5    D0  0422   714          MOVL    UCB$W_TT_SPEED-2(R5),R0; RETURN SPEED
51       00F6 C5     FF3FFFFF 8F   CB  0427   715          BICL3   #^C<<UCB$M_TT_PARITY!UCB$M_TT_ODD>@16>,UCB$B_TT_PARITY-2(R5),R1;
                 51    00F6 C5    B0  0431   716          MOVW    UCB$B_TT_CRFILL(R5),R1  ; INSERT FILL DATA
                      50    01    B0  0436   717          MOVW    #SS$_NORMAL,R0                  ; SET STATUS
                            02F9    31  0439   718          BRW     TTY$DONE
                                    043C   719
                                    043C   720 NOPRIV_EXIT:
```

```
                50    24   D0   043C   721          MOVL    #SS$_NOPRIV,R0          ; SET NO PRIV
                      51   D4   043F   722          CLRL    R1                      ; CLEAR R1
                   02F1    31   0441   723          BRW     TTY$DONE
                                0444   724
```

```
                        0444   726 ;
                        0444   727 ; WRITE OPERATION
                        0444   728 ;
                        0444   729 DO_WRITE:                                ;
                        0444   730 ;
                        0444   731 ; Control only comes here in the case of half duplex writes.  Full
                        0444   732 ; duplex writes use the TTY$WRTSTARTIO entry point.
                        0444   733 ;
          53    2C A3   D0    0444   734          MOVL    IRP$L_SVAPTE(R3), R3    ; Get addr of write block
00000532'EF     9F      0448   735          PUSHAB  TTY$STARTOUTPUT         ; if write is started, control
                        044E   736                                          ; will return to STARTOUTPUT
        0040    30      044E   737          BSBW    WRTSTARTIO              ; if queued, control will return
                05      0451   738          RSB                             ; here.  Return to caller.
```

```
                        .SBTTL  TTY$WRTSTARTIO - Starts or queues a write operation

;++
;
; Functional description:
;
;       If called from an FDT routine (or from EXE$BRDCST),
;       TTY$WRTSTARTIO first raises to device IPL, and then calls the
;       internal routine. All other code enters through the WRTSTARTIO
;       entry point.
;
;       If a write is occurring, the routine queues the write buffer.
;       If a read is occurring, but the buffer header specifies
;            write-breakthrough, the routine starts the write.
;       If a read is occurring, but no characters have been received
;            yet, the routine starts the write.
;       Otherwise, the routine queues the write buffer.
;
;       To start the write operation, the routine writes the address
;       of the buffer in UCB$L_TT_WRTBUF, sets and clears various
;       state bits, and returns.
;
;       To queue the buffer, the routine inserts the buffer address at
;       the end of the queue unless the header specfies write-
;       breakthrough. In the latter case, the buffer address is inserted
;       after the last write-breakthrough request in the queue.
;
;       Returning from WRTSTARTIO is odd. The routine assumes that 0(SP)
;       is the address to return to if the write is to start now.
;       If the routine instead queues the write, the routine pops this
;       start-write address of the stack, and returns to the real
;       caller.
;
; Inputs:
;
;       R3      - address of the write buffer
;       R5      - address of the UCB
;
; Implicit inputs:
;
;       The write buffer consists of a header, and an optional message
;       buffer. For broadcast messages, the message buffer is absent.
;       TTY$L_WB_FR3 is 0 for a normal broadcast and 1 for and ANSI
;       broadcast or one that specified norefresh.
;
; Outputs:
;
;       If the broadcast message is rejected, the TTY$L_WB_END field
;       of the write packet is zeroed.
;
;       R0      - preserved
;       R1      - scratch
;       R2      - address of UCB state bits
;       R3      - address of buffer
;       R4      - if packet is started, address of IRP or 0
;               - if packet is queued, scratch
;       R5      - address of UCB
```

```
                                0452   797 ;
                                0452   798 ; Implicit outputs:
                                0452   799 ;
                                0452   800 ;       Buffer may be entered in queue.
                                0452   801 ;
                                0452   802 ;       If write operation is started,
                                0452   803 ;       UCB$L_TT_WRTBUF - address of buffer
                                0452   804 ;       UCB$Q_TT_STATE  - write bit, and other bits from IRP are set
                                0452   805 ;                         control-O may be canceled
                                0452   806 ;       UCB$L_DEVDEPEND - mailbox may be enabled
                                0452   807 ;
                                0452   808 ;--
                                0452   809
                                0452   810 TTY$WRTSTARTIO::                            ; Start or queue write.
51    00A0 C5    D0             0452   811         MOVL    UCB$L_TL_PHYUCB(R5),R1      ; GET PUCB ADDRESS
               22  13             0457   812         BEQL    30$                         ; NONE CURRENTLY EXISTS
            55   51  D0             0459   813         MOVL    R1,R5                       ; SWITCH TO PUCB CONTEXT
              24 A3  D5             045C   814         TSTL    TTY$L_WB_IRP(R3)            ; Is this a broadcast?
               0C  13             045F   815         BEQL    20$                         ; YES, SPECIAL CASE
                                0461   816 10$:                                        ; Acceptable packet.
             FB9C'  30             0461   817         BSBW    TTY$LOCK                    ; Raise to DIPL, get states.
 00000532'EF    9F             0464   818         PUSHAB  TTY$STARTOUTPUT             ; Set up return address to
                                046A   819                                             ; start the output.
               25  10             046A   820         BSBB    WRTSTARTIO                  ; Start or queue the packet.
               05  046C   821         RSB                                 ; If packet queued, control
                                046D   822                                             ; returns here, so return to
                                046D   823                                             ; caller.
                                046D   824 ;       INTERNAL BROADCAST PACKET.
                                046D   825 ;       CHECK FOR DISABLE
                                046D   826 20$:
                             D3 046D   827         BITL    #TT$M_PASSALL!-             ; Test for passall and/or
                                046E   828                 TT$M_NOBRDCST,-             ; nobroadcast modes set in the
44 A5    00020001 8F                046E   829                 UCB$L_DEVDEPEND(R5)         ; term's UCB (ignore NOECHO).
                EA  13             0475   830         BEQL    10$                         ; Continue if not set.
              20 A3  D4             0477   831 25$:    CLRL    TTY$L_WB_END(R3)            ; Zero end address to indicate
                                047A   832                                             ; failure to EXE$BRDCST.
                             05 047A   833         RSB                                 ; And return to EXE$BRDCST.
                                047B   834
                                047B   835 ;       LUCB CURRENTLY DETACHED
                                047B   836 ;       COMPLETE THE WRITE
                                047B   837         ASSUME IRP$L_IOST1+4 EQ IRP$L_IOST2
                                047B   838 30$:
51    24 A3    D0             047B   839         MOVL    TTY$L_WB_IRP(R3),R1         ; GET IRP ADDRESS
               F6  13             047F   840         BEQL    25$                         ; INTERNAL BROADCAST, REJECT IT.
            53   51  D0             0481   841         MOVL    R1,R3                       ; GET IRP ADDRESS
              38 A3  7C             0484   842         CLRQ    IRP$L_IOST1(R3)             ; INIT IOSB RETURN
 38 A3    01  B0             0487   843         MOVW    #SS$_NORMAL,IRP$L_IOST1(R3)
00000000'GF    17             048B   844         JMP     G^COM$POST
                                0491   845
                                0491   846
                                0491   847
                                0491   848 WRTSTARTIO:                                 ; Checks for start or queue.
                                0491   849
                                0491   850 ;
                                0491   851 ; Inputs:
                                0491   852 ;
                                0491   853 ;       R2      - address of state bits longword
```

```
                         0491    854 ;       R3      - address of write packet
                         0491    855 ;       R5      - address of the device's UCB
                         0491    856 ;
                         0491    857 ;       0(SP)   - address to return if write is queued
                         0491    858 ;       4(SP)   - address to return to if write is started
                         0491    859 ;
                         0491    860
                   01    BB    0491    861         PUSHR   #^M<R0>                         ; Save a register.
          50    00CC C5    9E    0493    862         MOVAB   UCB$L_TT_WFLINK(R5),R0          ; Get address of write queue.
            54     24 A3    D0    0498    863         MOVL    TTY$L_WB_IRP(R3),R4             ; Get address of IRP.
                         049C    864         IF_STATE -                              ; If writing is in progress,
                         049C    865                 WRITE,QUEUE_PKT                 ; just queue the packet.
                   54    D5    04A0    866         TSTL    R4                              ; See if the packet has an IRP.
                   42    13    04A2    867         BEQL    START_PKT                       ; If not, just start the packet.
                         04A4    868         IF_NOT_STATE =                          ; If not in a read state,
                         04A4    869                 READ,START_PKT                  ; go ahead and start the packet.
                         04A8    870         IF_STATE -                              ; If noecho read, no blocking
                         04A8    871                 NOECHO,START_PKT                ; so start the write
                   09    E0    04AC    872         BBS     #IO$V_BREAKTHRU,-
                35 20 A4          04AE    873                 IRP$W_FUNC(R4),START_PKT; Start if break thru write.
                51    78 A5    D0    04B1    874         MOVL    UCB$L_SVAPTE(R5),R1             ; get the read packet address
                      3C A1    B5    04B5    875         TSTW    TTY$W_RB_TXTOFF(R1)             ; and check if we have started typing
                         2C    13    04B8    876         BEQL    START_PKT                       ; go start the packet.
                         19    11    04BA    877         BRB     QUEUE_LAST                      ; Otherwise, queue packet at end
                         04BC    878                                                 ; of queue.
                         04BC    879
                         04BC    880 QUEUE_PKT:
                   54    D5    04BC    881         TSTL    R4                              ; If an IRP is associated,
                   15    12    04BE    882         BNEQ    QUEUE_LAST                      ; queue packet at end of queue.
                      54 50    D0    04C0    883         MOVL    R0,R4                           ; Make a copy of queue head.
                         04C3    884
                         04C3    885 10$:
                   51    64    D0    04C3    886         MOVL    TTY$L_WB_FLINK(R4),R1           ; Get first queue entry.
                   50    51    D1    04C6    887         CMPL    R1,R0                           ; See if at end of queue.
                         0A    13    04C9    888         BEQL    QUEUE_LAST                      ; If yes, put at end of queue.
                      24 A1    D5    04CB    889         TSTL    TTY$L_WB_IRP(R1)                ; Else, see if this entry has an
                         04CE    890                                                 ; associated IRP.
                         09    12    04CE    891         BNEQ    INSERT_PKT                      ; If yes, branch to insert
                         04D0    892                                                 ; packet before it.
                   54    51    D0    04D0    893         MOVL    R1,R4                           ; Otherwise, go on to next
                         EE    11    04D3    894         BRB     10$                             ; entry in queue.
                         04D5    895
                         04D5    896 QUEUE_LAST:                                     ; Queue at end of queue.
                54    04 A0    D0    04D5    897         MOVL    TTY$L_WB_BLINK(R0),R4           ; Get back pointer.
                         04D9    898
                         04D9    899 INSERT_PKT:
                   63    0E    04D9    900         INSQUE  TTY$L_WB_FLINK(R3),-            ; Insert new packet in the
                   64          04DB    901                 TTY$L_WB_FLINK(R4)              ; queue.
                   01    BA    04DC    902         POPR    #^M<R0>                         ; Remove saved register and
                51    6E    D0    04DE    903         MOVL    (SP),R1                         ; get queued address
                5E    08    C0    04E1    904         ADDL    #8,SP                           ; clean stack
                   61    17    04E4    905         JMP     (R1)                            ; return to queued address
                         04E6    906
                         04E6    907 START_PKT:                                      ; Start the packet,
          00D4 C5    53    D0    04E6    908         MOVL    R3,UCB$L_TT_WRTBUF(R5)          ; Point to packet from UCB.
                         04EB    909         SET_STATE -                             ; Set the write state.
                         04EB    910                 WRITE
```

```
                                54   D5  04EF   911          TSTL    R4                          ; If this write does not have an
                                31   13  04F1   912          BEQL    20$                         ; IRP, don't check IRP fields.
                          62    40 A4  C8  04F3   913          BISL    IRP$Q_TT_STATE(R4),(R2)     ; Set write state bits.
                       04 A2    44 A4  C8  04F7   914          BISL    IRP$Q_TT_STATE+4(R4),4(R2)      ; Set write state bits.
                                38 A4  D4  04FC   915          CLRL    IRP$L_MEDIA(R4)             ; Set up IRP for completion.
                                07     E1  04FF   916          BBC     #IO$V_ENABLMBX,-            ; Branch if enable-mailbox
                             15 20 A4           0501   917                  IRP$W_FUNC(R4),10$      ; is not requested.
                                           0504   918
                          51    00C0 C5  D0  0504   919          MOVL    UCB$L_TT_LOGUCB(R5),R1      ; GET LOGICAL UCB ADDRESS
                    44 A5    00010000 8F  CA  0509   920          BICL    #TT$M_MBXDSABL,UCB$L_DEVDEPEND(R5) ; CLEAR MAILBOX DISABLED PHYSICAL
                    44 A1    00010000 8F  CA  0511   921          BICL    #TT$M_MBXDSABL,UCB$L_DEVDEPEND(R1) ; CLEAR MAILBOX DISABLED LOGICAL
                                           0519   922
                                           0519   923 10$:
                                06     E1  0519   924          BBC     #IO$V_CANCTRLO,-            ; Branch if cancel control-O
                             11 20 A4           051B   925                  IRP$W_FUNC(R4),30$      ; is not requested.
                                           051E   926          CLR_STATE -                         ; Clear control-O state.
                                           051E   927                  CTRLO
                                0B     11  0522   928          BRB     30$                         ; And start the output.
                                           0524   929
                                           0524   930 ;
                                           0524   931 ; Start a broadcast packet.
                                           0524   932 ;
                                           0524   933
                                           0524   934 20$:
                             0B A3     94  0524   935          CLRB    TTY$B_WB_FIPL(R3)           ; Indicate block free to fork (for DMA)
                          04 10 A3     E9  0527   936          BLBC    TTY$L_WB_FR3(R3),30$        ; Branch if ANSI broadcast or norefresh
                                           052B   937          SET_STATE -
                                           052B   938                  <REFRSH>                    ; Set refresh read
                                           052F   939 30$:                                        ; Go output buffer.
                                03     BA  052F   940          POPR    #^M<R0,R1>                  ; Restore saved register
                                           0531   941                                              ; and queued address.
                                05     05  0531   942          RSB                                 ; And return to caller.
```

```
                     0532   944          .SBTTL  TTY$STARTOUTPUT - START OUTPUT OPERATION ON UNIT
                     0532   945
                     0532   946 ;++
                     0532   947 ; TTY$STARTOUTPUT - START OUTPUT ON UNIT
                     0532   948 ;
                     0532   949 ; FUNCTIONAL DESCRIPTION:
                     0532   950 ;
                     0532   951 ; THIS ROUTINE IS USED TO INITIATE OUTPUT ON A UNIT. THIS OPERATION STARTS
                     0532   952 ; THE FLOW OF DATA EVEN IN THE CASE OF READS. THE ACTION IS TO TEST THE
                     0532   953 ; STATE OF INTERRUPT EXPECTED. IF AN INTERRUPT IS EXPECTED, THEN NOTHING NEED BE DON
                     0532   954 ; BECAUSE A SUBSEQUENT INTERRUPT WILL CONTINUE APPROP. WITH THE CURRENT STATE.
                     0532   955 ; IF NO INTERRUPT IS EXPECTED, THEN THE TTY$GETNEXTCHAR ROUTINE IS ENTERED TO RETURN
                     0532   956 ; THE NEXT CHARACTER(S) FOR THE UNIT. THEN IF AVAILABLE THE PORT DRIVER
                     0532   957 ; STARTIO ROUTINE IS ENTERED.
                     0532   958 ; THIS OPERATION IS IDENTICAL TO THE OPERATION OF AN OUTPUT READY INTERRUPT.
                     0532   959 ;
                     0532   960 ; INPUTS:
                     0532   961 ;
                     0532   962 ;       R2 = ADDRESS OF THE UNIT STATE VECTOR
                     0532   963 ;       R5 = UCB ADDRESS
                     0532   964 ;
                     0532   965 ; OUTPUTS:
                     0532   966 ;
                     0532   967 ;       NONE
                     0532   968 ;--
                     0532   969 TTY$STARTOUTPUT::                            ; START OUTPUT
10 64 A5    01   E0  0532   970          BBS     #UCB$V_INT,UCB$W_STS(R5),100$; LEAVE HERE IF INTERRUPT EXPECTED
 50    0118 C5   D0  0537   971          MOVL    UCB$L_TT_PORT(R5),R0        ; GET THE PORT'S VECTOR TABLE ADDRESS
          FAC1'  30  053C   972          BSBW    TTY$GETNEXTCHAR             ; GET NEXT CHARACTER FOR UNIT
   03 010B C5   E9  053F   973          BLBC    UCB$B_TT_OUTYPE(R5),100$    ; LEAVE IF NOTHING TO OUTPUT
      00 B0     17  0544   974          JMP     @PORT_STARTIO(R0)           ; START OUTPUT ON LINE
                05  0547   975 100$:    RSB                                 ; RETURN
```

```
                                0548   977          .SBTTL  TTY$GETNXTWRITE - Start next write or restart read
                                0548   978
                                0548   979 ;++
                                0548   980 ;
                                0548   981 ; Functional description:
                                0548   982 ;
                                0548   983 ;       This routine gains control at device IPL on return from the
                                0548   984 ;       VMS fork queuing routine. The routine tries to restart a
                                0548   985 ;       suspended but now active read, or to dequeue and start the
                                0548   986 ;       next write request vis WRTSTARTIO.
                                0548   987 ;
                                0548   988 ;       The routine always returns to the caller of TTY$WRITEDONE,
                                0548   989 ;       TTY$READONE, or BRDCST in TTYCHARO. This caller is usually
                                0548   990 ;       GETNEXTCHAR, so setting states causes the driver to go on
                                0548   991 ;       echoing and outputting.
                                0548   992 ;
                                0548   993 ; Inputs:
                                0548   994 ;
                                0548   995 ;       0(SP)   - address of the UCB state vector
                                0548   996 ;       4(SP)   - address of the UCB
                                0548   997 ;
                                0548   998 ; Outputs:
                                0548   999 ;
                                0548  1000 ;       R2      - address of the UCB state vector
                                0548  1001 ;       R3      - address of a write buffer if writing is to begin
                                0548  1002 ;       R5      - address of the UCB
                                0548  1003 ;
                                0548  1004 ;       The 2 named inputs are removed from the stack.
                                0548  1005 ;
                                0548  1006 ;--
                                0548  1007
                                0548  1008 TTY$GETNXTWRITE::                        ; Check for a new write.
                         24     0548  1009          POPR    #^M<R2,R5>             ; Restore UCB state address and
                                054A  1010                                         ; UCB address.
                                054A  1011          IF_NOT_STATE -                 ; If not in a read state, just
                                054A  1012                  READ,10$               ; branch forward.
                                054E  1013          IF_STATE -                     ; If noecho, don't block writes
                                054E  1014                  NOECHO,10$
                    00CC C5     D1  0552  1015          CMPL    UCB$L_TT_WFLINK(R5),-
                    00D0 C5         0556  1016                  UCB$L_TT_WBLINK(R5)
                                                               ; queue empty?
                         0A     13  0559  1017          BEQL    5$                 ; Branch if yes
                53       00CC C5     D0  055B  1018          MOVL    UCB$L_TT_WFLINK(R5),R3 ; Fetch address of next irp
                                09     E0  0560  1019          BBS     #IO$V_BREAKTHRU,-
                          09 20 A3         0562  1020                  IRP$W_FUNC(R3),10$ ; Start if break thru write.
                       53    78 A5     D0  0565  1021 5$:      MOVL    UCB$L_SVAPTE(R5),R3 ; get the read packet address
                             3C A3     B5  0569  1022          TSTW    TTY$W_RB_TXTOFF(R3) ; see if any input
                                056C  1023                                         ; has been received.
                                15     12  056C  1024          BNEQ    20$            ; If yes, go restart read.
                                056E  1025
                                056E  1026 10$:     IF_STATE WRITE,30$             ; if we are writing then don't get the
                                0572  1027                                         ; next write
                                0572  1028                                         ; Otherwise, look for a write.
                53       00CC D5     0F  0572  1029          REMQUE  @UCB$L_TT_WFLINK(R5),R3 ; Get a new write buffer.
                                0A     1D  0577  1030          BVS     20$            ; Branch if no buffers exist.
                 00000586'EF           9F  0579  1031          PUSHAB  30$            ; Save a write start return
                                057F  1032                                         ; address.
                                FF0F   30  057F  1033          BSBW    WRTSTARTIO     ; Start the write.
```

```
                     05  0582  1034                RSB                                 ; Return to GETNEXTCHAR.
                         0583  1035
                         0583  1036 20$:
                FA7A'    30  0583  1037                BSBW    TTY$RESTARTIO               ; Restart the read, if any.
                         0586  1038
                         0586  1039 30$:                                                 ; Joint read/write return.
                     05  0586  1040                RSB                                 ; Return.
```

```
                                                M 7
0587  1042          .SBTTL  TTY$WRITEDONE - Complete a write operation
0587  1043
0587  1044 ;++
0587  1045 ; TTY$WRITEDONE - WRITE OPERATION DONE
0587  1046 ;
0587  1047 ; FUNCTIONAL DESCRIPTION:
0587  1048 ;
0587  1049 ;       This routine creates a fork process to complete the write, and
0587  1050 ;       checks for another write packet to start up.
0587  1051 ;
0587  1052 ; INPUTS:
0587  1053 ;
0587  1054 ;       R2 = ADDRESS OF THE UNIT STATE VECTOR
0587  1055 ;       R5 = UCB ADDRESS
0587  1056 ;
0587  1057 ;       TTY$W_WB_STATUS - status of operation
0587  1058 ;       TTY$W_WB_BCNT   - number of bytes transferred
0587  1059 ;
0587  1060 ; OUTPUTS:
0587  1061 ;
0587  1062 ;       R2,R5 ARE PRESERVED.
0587  1063 ;
0587  1064 ;--
0587  1065
0587  1066 TTY$WRITEDONE::                           ; Complete write operation.
0587  1067
0587  1068 ;
0587  1069 ; This routine used to start by clearing a whole raft of state bits.
0587  1070 ; I only turn off write-related bits, and I do that in TTY$GETNXTWRITE.
0587  1071 ; The bits I no longer modify are:
0587  1072 ;
0587  1073 ;       READ, DEL, XON, EOL, PROMPT, CTRLR, NOFLTR, ESC, ESC_O, and
0587  1074 ;       BADESC
0587  1075 ;
0587  1076
0587  1077
        24   BB  0587  1078          PUSHR   #^M<R2,R5>                ; Save state and UCB address.
0589  1079 14$:
0589  1080
  53  00D4 C5   0589  1081          MOVL    UCB$L_TT_WRTBUF(R5),R3    ; Get address of write buffer.
058E  1082
058E  1083 ;
058E  1084 ; NEW LINE MODIFIER
058E  1085 ;
  54    24 A3   058E  1086          MOVL    TTY$L_WB_IRP(R3),R4       ; Get address of associated IRP.
        0C 13   0592  1087          BEQL    10$
07 20 A4  0A E1 0594  1088          BBC     #IO$V_NEWLINE,IRP$W_FUNC(R4),10$; NO NEWLINE THEN DON'T ADD A THING
0599  1089          SET_STATE <SENDLF,SKIPLF,NL>
05A0  1090 10$:
05A0  1091          CLR_STATE -                       ; Clear the write bits.
05A0  1092                    <WRITE,WRTALL>
        9D AF   9F  05A8  1093          PUSHAB  TTY$GETNXTWRITE           ; Return address after queuing fork
05AB  1094
05AB  1095 WRITEPOST:
05AB  1096
        0B A5   90  05AB  1097          MOVB    UCB$B_FIPL(R5),-          ; Set up fork IPL in the buffer
        0B A3       05AE  1098                  TTY$B_WB_FIPL(R3)         ; block.
```

```
                54   24 A3    D0  05B0  1099          MOVL    TTY$L_WB_IRP(R3),R4      ; Get address of associated IRP.
                      08 12    05B4  1100          BNEQ    5$                       ; one there then continue
                      06 90    05B6  1101          MOVB    #IPL$_QUEUEAST,-         ; for broadcast fork to ipl6
                   0B A3       05B8  1102                  TTY$B_WB_FIPL(R3)
                      7E D4    05BA  1103          clrl    -(sp)                    ; no irp then no process to fork to
                      03 11    05BC  1104          brb     7$
                               05BE  1105 5$:
                   0C A4       05BE  1106          PUSHL   IRP$L_PID(R4)            ; FORK ON THE PID OF THE IO OWNER
                55    53       05C1  1107 7$:      MOVL    R3,R5                    ; Setup fork block address.
          00000000'EF   16      05C4  1108          JSB     TTY$SYNCH                ; Create a fork process.
                               05CA  1109
                               05CA  1110 ;
                               05CA  1111 ; This is the write completion fork process. Registers are as follows:
                               05CA  1112 ;
                               05CA  1113 ;        R4      - address of IRP
                               05CA  1114 ;        R5      - address of write buffer (TWP)
                               05CA  1115 ;
                               05CA  1116
                53    54       D0  05CA  1117          MOVL    R4,R3                    ; Need IRP in R3 for I/O post.
                      54 13    05CD  1118          BEQL    100$
                               05CF  1119
                               05CF  1120          .IF DF  CA$_MEASURE_IOT
                               05CF  1121 ;
                               05CF  1122 ;ACCUMULATE STATISTICS ON NUMBER OF CHARACTERS AND I/OS TO TERMINALS.
                               05CF  1123 ;
                               05CF  1124          BSBB    TTSTATS                  ; CALL STATISTICS ROUTINE.
                               05CF  1125
                               05CF  1126          .ENDC
                               05CF  1127
                               05CF  1128 ;
                               05CF  1129 ; NOTE: IRP$L_MEDIA = IRP$L_IOST1
                               05CF  1130 ; NOTE: terminal position is 0-based; interface position is 1-based
                               05CF  1131 ;
                               05CF  1132
              54    55       D0  05CF  1133          MOVL    R5,R4                    ; Put buffer address in R4.
                38 A3    3C    05D2  1134          MOVZWL  IRP$L_MEDIA(R3),-        ; number of lines output for the
                3C A3          05D5  1135                  IRP$L_IOST2(R3)          ; write QIO, and zero other values
                28 A4    D0    05D7  1136          MOVL    TTY$W_WB_STATUS(R4),-    ; move status and count of bytes
                38 A3          05DA  1137                  IRP$L_IOST1(R3)          ; transferred into IOSB
                               05DC  1138
             55    1C A3       D0  05DC  1139          MOVL    IRP$L_UCB(R3),R5         ; Regain LUCB address.
          55    00A0 C5       D0  05E0  1140          MOVL    UCB$L_TL_PHYUCB(R5),R5   ; Switch to Physical context
                      1D 13    05E5  1141          BEQL    15$                      ; Disconnect has occured!
                00FC C5    B1  05E7  1142          CMPW    UCB$W_TT_CURSOR(R5),-    ; Is cursor marker beyond the right-
                   42 A5       05EB  1143                  UCB$W_DEVBUFSIZ(R5)      ; hand edge of screen?
                      09 1E    05ED  1144          BGEQU   12$                      ; Branch if cursor has gone too far.
                00FC C5    A1  05EF  1145          ADDW3   UCB$W_TT_CURSOR(R5),-    ; Else return cursor column position,
             3E A3    01       05F3  1146                  #1,IRP$L_IOST2+2(R3)     ; adjusted for zero offset, in IOSB.
                      05 11    05F6  1147          BRB     14$                      ; Continue building IOSB.
                   42 A5    B0  05F8  1148 12$:     MOVW    UCB$W_DEVBUFSIZ(R5),-    ; If necessary, return cursor column
                   3E A3       05FB  1149                  IRP$L_IOST2+2(R3)        ; position in IOSB as right-hand edge.
                00FE C5    81  05FD  1150 14$:     ADDB3   UCB$B_TT_LINE(R5),-      ; move line position into IOSB
             3F A3    01       0601  1151                  #1,IRP$L_IOST2+3(R3)     ;
                               0604  1152
                   08 A4    B0  0604  1153 15$:     MOVW    TTY$W_WB_SIZE(R4),-      ; Move size of buffer into IRP
                   30 A3       0607  1154                  IRP$W_BOFF(R3)           ; to record quota used.
             55    1C A3       D0  0609  1155          MOVL    IRP$L_UCB(R3),R5         ; Restore logical UCB address
```

```
    58 A5    53  D1  060D  1156          CMPL    R3,UCB$L_IRP(R5)        ; Is this the current write
             06  13  0611  1157          BEQL    30$                     ; blocking the i/o queue?
                     0613  1158
  00000000'GF    17  0613  1159 20$:     JMP     G^COM$POST              ; Full duplex: complete write
                     0619  1160
                     0619  1161 30$:                                     ; Half duplex:
    50    38 A3  7D  0619  1162          MOVQ    IRP$L_MEDIA(R3),R0      ; Load IOST1 and IOST2 in R0,R1
                     061D  1163          REQCOM                          ; Complete request and get next
                     0623  1164                                          ; entry in system queue.
                     0623  1165 100$:
    53    20 A5  D0  0623  1166          MOVL    TTY$L_WB_END(R5),R3     ; GET THE ADDRESS OF THE LAST CHARACTER
          2C B5  17  0627  1167          JMP     @TTY$L_WB_RETADDR(R5)   ; Want fork process to gain control
                     062A  1168                                          ; string for fork process use.
                     062A  1169
                     062A  1170
```

```
                     062A  1172          .SBTTL  TTY$WRITEPOST - QUEUE A WRITE COMPLETION
                     062A  1173
                     062A  1174 ;++
                     062A  1175 ; TTY$WRITEPOST - QUEUE A WRITE COMPLETION
                     062A  1176 ;
                     062A  1177 ; FUNCTIONAL DESCRIPTION:
                     062A  1178 ;
                     062A  1179 ;       THIS ROUTINE FORKS ON A TWP TO COMPLETE A QUEUED WRITE OPERATION
                     062A  1180 ;       BOTH HALF AND FULL DUPLEX.
                     062A  1181 ;
                     062A  1182 ; INPUTS:
                     062A  1183 ;
                     062A  1184 ;       R4 = TWP ADDRESS
                     062A  1185 ;       R5 = UCB ADDRESS
                     062A  1186 ;
                     062A  1187 ;       UCB$W_BOFF - STATUS OF OPERATION
                     062A  1188 ;
                     062A  1189 ; OUTPUTS:
                     062A  1190 ;
                     062A  1191 ;       R0,R1,R2,R3,R5 ARE PRESERVED
                     062A  1192 ;--
                     062A  1193
                     062A  1194 TTY$WRITEPOST::
                     062A  1195
        28   BB       062A  1196          PUSHR   #^M<R3,R5>                  ; SAVE REGISTERS
53      54   D0       062C  1197          MOVL    R4,R3                       ; TWP ADDRESS
  2A    A3   B4       062F  1198          CLRW    TTY$W_WB_BCNT(R3)           ; NONE TRANSFERED
  7C    A5   B0       0632  1199          MOVW    UCB$W_BOFF(R5),-            ; SAVE COMPLETION STATUS
  28    A3                  1200                  TTY$W_WB_STATUS(R3)
    FF71     30       0637  1201          BSBW    WRITEPOST                   ; QUE THE FORK
        28   BA       063A  1202          POPR    #^M<R3,R5>
             05       063C  1203          RSB
                      063D  1204
                      063D  1205
```

```
063D  1207
063D  1208              .IF DF  CA$_MEASURE_IOT
063D  1209 ;
063D  1210 ;       Subroutine to accumulate statistics on the number of
063D  1211 ;       the number of characters read and written to terminals
063D  1212 ;
063D  1213 TTSTATS:BLBC    G^PMS$GL_DOSTATS,40$    ; IF FLAG SET, BYPASS STATISTICS CODE
063D  1214         MOVZWL  IRP$W_BCNT(R3),R1       ; GET # CHARACTERS TRANSFERRED.
063D  1215         DIVL3   #5,R1,R0                ; STATISTICS ARE KEPT IN INCREMENTS
063D  1216                                         ;     OF 5 CHARACTERS.
063D  1217         CMPL    #9,R0                   ; LAST ENTRY IN TABLE IS FOR I/OS
063D  1218                                         ;     OF >= 45 CHARACTERS.
063D  1219         BGEQ    10$
063D  1220         MOVL    #9,R0
063D  1221 10$:    CMPZV   #IRP$V_FCODE,#IRP$S_FCODE,IRP$W_FUNC(R3),#TTY$C_FC_READ
063D  1222                                         ; CHECK IF JUST FINISHED A READ OR WRITE.
063D  1223         BNEQ    20$                     ; BRANCH FOR WRITE
063D  1224 ;
063D  1225 ; COMPILE STATISTICS FOR READ
063D  1226 ;
063D  1227         INCL    G^PMS$AL_READTBL[R0]    ; INCREMENT APPROPRIATE RANGE.
063D  1228         INCL    G^PMS$GL_TREADS         ; INCREMENT READ COUNT
063D  1229         ADDL2   R1,G^PMS$GL_READCNT     ; INCREMENT TOTAL COUNT FOR CHARACTERS
063D  1230         BRB     40$
063D  1231 ;
063D  1232 ; COMPILE STATISTICS FOR WRITE
063D  1233 ;
063D  1234 20$:    INCL    G^PMS$AL_WRITETBL[R0]   ; INCREMENT APPROPRIATE RANGE.
063D  1235         INCL    G^PMS$GL_TWRITES        ; INCREMENT WRITE COUNT
063D  1236         ADDL2   R1,G^PMS$GL_WRTCNT      ; INCREMENT TOTAL COUNT FOR CHARACTERS
063D  1237                                         ;     WRITTEN.
063D  1238 40$:    RSB                             ; RETURN TO CALLER.
063D  1239
063D  1240              .ENDC
```

```
                                063D  1242          .SBTTL  TTY$READONE - READ OPERATION DONE
                                063D  1243 ;++
                                063D  1244 ; TTY$READONE - READ I/O OPERATION DONE
                                063D  1245 ;
                                063D  1246 ; FUNCTIONAL DESCRIPTION:
                                063D  1247 ;
                                063D  1248 ; THIS ROUTINE IS ENTERED TO COMPLETE THE CURRENT READ OPERATION.
                                063D  1249 ; THE ACTION IS TO RESET THE STATE OF THE UNIT TO REFLECT THE CHANGE AND TO
                                063D  1250 ; FORK ON THE IRP TO COMPLETE THE PROCESSING.
                                063D  1251 ;
                                063D  1252 ; INPUTS:
                                063D  1253 ;
                                063D  1254 ;       R2 = ADDRESS OF THE UNIT STATE VECTOR
                                063D  1255 ;       R5 = UCB ADDRESS
                                063D  1256 ;
                                063D  1257 ;               UCB$W_BOFF = STATUS WORD
                                063D  1258 ;               UCB$W_BCNT = COUNT OF TRANSFER
                                063D  1259 ;
                                063D  1260 ;       IRP$L_MEDIA(CURRENT PACKET) = TERMINATOR AND TERMINATOR SIZE
                                063D  1261 ;
                                063D  1262 ; OUTPUTS:
                                063D  1263 ;
                                063D  1264 ;
                                063D  1265 ;       NONE
                                063D  1266 ;--
                                063D  1267 .enable lsb
                                063D  1268 TTY$READONE::                                ; READ I/O DONE
03 44 A5   12   E1              063D  1269          BBC     #TT$V_READSYNC,UCB$L_DEVDEPEND(R5),10$; BR IF NOT READSYNC
         F988'  30              0642  1270          BSBW    TTY$XOFF                    ; SEND XOFF
   68 A5   02   AA              0645  1271 10$:     BICW    #UCB$M_TT_TIMO,UCB$W_DEVSTS(R5); CLEAR TIMEOUT ENABLED
                                0649  1272 ;
                                0649  1273 ; SET UP ERRORS ON ESCAPE SEQUENCES
                                0649  1274 ;
                                0649  1275          IF_NOT_STATE ESC,15$                ; IF NOT ESCAPE THEN BR
7C A5   01FC 8F   B0            064D  1276          MOVW    #SS$_PARTESCAPE,UCB$W_BOFF(R5); ASSUME PARTIAL ESCAPE SEQUENCE
     54   78 A5   D0            0653  1277          MOVL    UCB$L_SVAPTE(R5),R4         ; GET THE ADDRESS OF THE READ PACKET
     53   58 A5   D0            0657  1278          MOVL    UCB$L_IRP(R5),R3            ; ADDRESS CURRENT PACKET
     53   3A A3   9B            065B  1279          MOVZBW  IRP$L_MEDIA+2(R3),R3        ; MAKE THE ESCAPE SEQUENCE COUNT A WORD
     3C A4   53   A2            065F  1280          SUBW    R3,TTY$W_RB_TXTOFF(R4)      ; SUBTRACT OUT TERMINATOR LENGTH
                                0663  1281 15$:     IF_NOT_STATE BADESC,20$             ; ESCAPE SYNTAX CORRECT?
     7C A5   3C   B0            0667  1282          MOVW    #SS$_BADESCAPE,UCB$W_BOFF(R5); SET STATUS FOR IMPROPER ESCAPE SEQ
                                0668  1283 ;
                                0668  1284 ; RESET PASSALL AND NOECHO IF MODES
                                0668  1285 ;
                                0668  1286 20$:
                                0668  1287
                                0668  1288          .IF DF  CA$_MEASURE_IOT
                                0668  1289
                                0668  1290          BLBC    G^PMS$GL_DOSTATS,25$        ; IF FLAG SET, BYPASS STATISTICS CODE
                                0668  1291          BBC     #TT$V_PASSALL,UCB$L_DEVDEPEND(R5),25$; BR IF NOT PASSALL
                                0668  1292          INCL    G^PMS$GL_PASSALL            ; INCREMENT PASSALL COUNT
                                0668  1293
                                0668  1294          .ENDC
                                0668  1295
  54   44 A5   FC 8F   88       0668  1296 25$:     BICB3   #^C<TT$M_PASSALL!TT$M_NOECHO>,UCB$L_DEVDEPEND(R5),R4;
04 A2   02   02   54   F0       0671  1297          INSV    R4,#TTY$V_ST_PASALL,#2,4(R2)            ; RESET PASSALL AND NOECHO
54   44 A5   01   03   EE       0677  1298          EXTV    #TT$V_ESCAPE,#1,UCB$L_DEVDEPEND(R5),R4  ; GET CURRENT SETTING
```

```
                04 A2   01    0B    54    F0  067D  1299                INSV    R4,#TTY$V_ST_ESCAPE,#1,4(R2)                    ; UPDATE IN STATE
                     04 48 A5    12    E1  0683  1300                BBC     #TT2$V_PASTHRU,UCB$L_DEVDEPND2(R5),98$   ; IN PASS THRU MODE
                                             0688  1301                SET_STATE PASACL
                                             068C  1302 98$:
                                             068C  1303
                                             068C  1304                CLR_STATE -                                     ; Clear state bits relevant to
                                             068C  1305                        <READ,DEL,EOL,-                         ; a read (this does not include
                                             068C  1306                        PROMPT,CTRLR,NOFLTR,-                   ; the write bits).
                                             068C  1307                        ESC,ESC_O,BADESC,PRE,TERMNORM,-
                                             068C  1308                        REFRSH,EDITREAD,SKIPCRLF,RDVERIFY,ECHAES,-
                                             068C  1309                        MULTI,RECALL,OVERSTRIKE,EDITING,QUOTING,BACKSPACE>
                      53    58 A5    D0    0699  1310                MOVL    UCB$L_IRP(R5),R3                        ; ADDRESS CURRENT PACKET
                      54    78 A5    D0    069D  1311                MOVL    UCB$L_SVAPTE(R5),R4                     ; GET THE ADDRESS OF THE READ PACKET
                012B  C5    3A A4    90    06A1  1312                MOVB    TTY$W_RB_CPZORG(R4),UCB$B_TT_OLDCPZORG(R5); SAVE BECAUSE
                                             06A7  1313                                                              ; WE MAY CONTINUE THIS READ
                   3C A3    0C A3    D0    06A7  1314                MOVL    IRP$L_PID(R3),IRP$L_TT_TERM(R3); SAVE DATA FOR FORK BLOCK
                   4C A3    08 A3    90    06AC  1315                MOVB    IRP$B_RMOD(R3),IRP$W_TT_PRMPT(R3);
                   08 A3    08 A5    90    06B1  1316                MOVB    UCB$B_FIPL(R5),IRP$B_RMOD(R3); SET FORK IPL
                   30 A3    7C A5    B0    06B6  1317                MOVW    UCB$W_BOFF(R5),IRP$W_BOFF(R3); SAVE STATUS
                   32 A3    3C A4    B0    06BB  1318                MOVW    TTY$W_RB_TXTOFF(R4),IRP$W_BCNT(R3); SAVE TRANSFER SIZE
                            24       BB    06C0  1319                PUSHR   #^M<R2,R5>                              ;
                         55    53    D0    06C2  1320                MOVL    R3,R5                                   ; SET UP FORK BLOCK ADDRESS
                      53    10 A3    7D    06C5  1321                MOVQ    IRP$L_AST(R3),R3                        ; GET PARAMS FOR FORK
                         FE7B CF    9F    06C9  1322                PUSHAB  W^TTY$GETNXTWRITE                       ; FORCE RETURN TO RESTORE UCB ADDRESS
                            3C A5    DD    06CD  1323                PUSHL   IRP$L_TT_TERM(R5)                       ; USE THE PID OF THE ISSUING PROCESS
                   00000000'EF       16    06D0  1324                JSB     TTY$SYNCH                               ; CREATE FORK PROCESS
                                             06D6  1325 ;
                                             06D6  1326 ; I/O DONE FORK PROCESS
                                             06D6  1327 ;
                      53    55    D0    06D6  1328                MOVL    R5,R3                                   ; RESTORE PACKET AND UCB ADDRESSES
                                             06D9  1329
                                             06D9  1330                .IF DF  CA$_MEASURE_IOT
                                             06D9  1331 ;
                                             06D9  1332 ;ACCUMULATE STATISTICS ON NUMBER OF CHARACTERS AND I/OS TO TERMINALS.
                                             06D9  1333 ;
                                             06D9  1334                BSBW    TTSTATS                                 ; CALL STATISTICS ROUTINE.
                                             06D9  1335
                                             06D9  1336                .ENDC
                                             06D9  1337
                      55    1C A3    D0    06D9  1338                MOVL    IRP$L_UCB(R3),R5                        ; GET LUCB ADDRESS FROM IRP
                   55    00A0 C5    D0    06DD  1339                MOVL    UCB$L_TL_PHYUCB(R5),R5                  ; SWITCH TO PHYSICAL USB CONTEXT
                      50    30 A3    D0    06E2  1340                MOVL    IRP$W_BOFF(R3),R0                       ; GET STATUS AND TRANSFER SIZE
                      54    3A A3    98    06E6  1341                MOVZBW  IRP$L_MEDIA+2(R3),R4                    ; GET THE BYTE COUNT OF THE TERMINATOR
                      52 A3          54    A0    06EA  1342                ADDW    R4,IRP$W_BCNT(R3)                       ; CALC TOTAL TRANSFER SIZE
                      54    2C A3    D0    06EE  1343                MOVL    IRP$L_SVAPTE(R3),R4                     ; GET ADDRESS OF THE BUFFER BLOCK
                21    20 A3          0F    E1    06F2  1344                BBC     #IO$V_EXTEND,IRP$W_FUNC(R3),27$
                39 A3          FF    8F    90    06F7  1345                MOVB    #^XFF,IRP$L_MEDIA+1(R3); INFORCE RESERVED FIELD
                17 40 A3             0A    E0    06FC  1346                BBS     #TTY$V_ST_RDVERIFY,IRP$Q_TT_STATE(R3),27$; DON'T DO IT FOR READ VERI
                      51    30 A4    3C    0701  1347                MOVZWL  TTY$W_RB_LINOFF(R4),R1                  ; get the offset to this character
                      2C A4          51    C0    0705  1348                ADDL    R1,TTY$L_RB_LIN(R4)                     ; ADD IN THE OFFSET TO GET AN ADDRESS
                      51    3C A4    3C    0709  1349                MOVZWL  TTY$W_RB_TXTOFF(R4),R1                  ; GET THE LENGTH OF THE READ
                            51    64    C0    070D  1350                ADDL    TTY$L_RB_TXT(R4),R1                     ; AND GET THE ADDRESS OF THE LAST CHARACTER
                      51    2C A4    C2    0710  1351                SUBL    TTY$L_RB_LIN(R4),R1                     ; SUBTRACT OUT THE ADDRESS OF THE
                   3B A3          51    90    0714  1352                MOVB    R1,IRP$L_MEDIA+3(R3)                    ; LAST CHARACTER AND THIS IS THE
                                             0718  1353                                                              ; OFFSET FROM THE END OF THE READ
                                             0718  1354                                                              ; TO THE LAST POSITION.
                      51    38 A3    D0    0718  1355 27$:    MOVL    IRP$L_MEDIA(R3),R1                      ; SET TERMINATOR DATA
```

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                                0730  1360                                          ; SAVE THE BUFFER.
                                0730  1361 READ$DONE:
4F 48 A5    0E    E0            0730  1362          BBS     #TT2$V_FALLBACK,UCB$L_DEVDEPND2(R5),200$; DO WE HAVE TO CHECK
                                0735  1363 END_FALL:                                  ; FOR INPUT FALLBACK
                                0735  1364
                                0735  1365 TTY$DONE:
   55    1C A3    D0            0735  1366          MOVL    IRP$L_UCB(R3),R5          ; RESTORE LOGICAL UCB ADDRESS
                                0739  1367          REQCOM                            ; COMPLETE REQUEST
                                073F  1368 ;
                                073F  1369 ; SAVE THE COMMAND IF WE ARE IN EDITING, THE READ WAS SUCESSFUL AND
                                073F  1370 ; IT WAS NOT A NOECHO READ.
                                073F  1371 ;
 022C 8F    50    B1            073F  1372 40$:    CMPW    R0,#SS$_TIMEOUT           ; ALLOW TIMEOUT ERRORS TO BE SAVED
                03 13            0744  1373          BEQL    42$                       ; ...
          E7    50 E9            0746  1374          BLBC    R0,READ$DONE              ; READ NOT SUCCESSFUL THEN DON'T SAVE
    44 A5       03 D3            0749  1375 42$:     BITL    #TT$M_NOECHO!TT$M_PASSALL,UCB$L_DEVDEPEND(R5);DON'T COPY ON
                E1 12            074D  1376          BNEQ    READ$DONE                 ; PASSALL OR NOECHO
 0000004C 8F    D3               074F  1377          BITL    #TTY$M_ST_NOECHO!TTY$M_ST_PASALL!TTY$M_ST_NOFLTR,-
       44 A3                     0755  1378                  IRP$Q_TT_STATE+4(R3)      ; WERE WE PASS ALL, NOECHO
                D7 12            0757  1379          BNEQ    READ$DONE                 ; OR NO FILTER THEN DON'T SAVE THIS BUFFER
                3F BB            0759  1380          PUSHR   #^M<R0,R1,R2,R3,R4,R5>    ; SAVE THE REGISTERS OVER THE MOVE
    50    3C A4    3C            075B  1381          MOVZWL  TTY$W_RB_TXTOFF(R4),R0    ; GET THE LENGTH
                1F 13            075F  1382          BEQL    35$                       ; IF THE LENGTH IS ZERO THEN DON'T SAVE
                                0761  1383                                            ; THE DATA
   50    00000100 8F    D1      0761  1384          CMPL    #TTY$K_TA_RCLLEN,R0       ; DOES ALL THE DATA FIT?
                07 18            0768  1385          BGEQ    30$                       ; YES THEN CONTINUE ON
   50    00000100 8F    D0      076A  1386          MOVL    #TTY$K_TA_RCLLEN,R0       ; ELSE USE THE WHOLE BFFER
      51    00E4 C5    D0       0771  1387 30$:     MOVL    UCB$L_TT_TYPAHD(R5),R1    ; GET THE ADDRESS OF THE TYPEAHEAD BUFFER
        14 A1    50 B0          0776  1388          MOVW    R0,TTY$W_TA_RCLSIZ(R1)    ; KEEP THE SIZE CORRECTLY
 18 A1    00 B4    50 28        077A  1389          MOVC3   R0,@TTY$L_RB_TXT(R4),TTY$A_TA_RCL(R1); MOVE THE DATA IN
                3F BA            0780  1390 35$:     POPR    #^M<R0,R1,R2,R3,R4,R5>    ; RESTORE THE REGISTERS AND
                AC 11            0782  1391 91$:     BRB     READ$DONE
                                0784  1392
                                0784  1393 ;
                                0784  1394 ; INPUT FALLBACK TABLE IMPLIMENTATION
                                0784  1395 ;
                                0784  1396 200$:
                3F BB            0784  1397          PUSHR   #^M<R0,R1,R2,R3,R4,R5>    ; SAVE THE REGISTERS OVER THE MOVE
   51    00000000'FF D0          0786  1398          MOVL    @TTY$A_INPFALL,R1         ; ANY INPUT FALLBACK
                0F 13            078D  1399          BEQL    210$
          50    3C A4            078F  1400          MOVZWL  TTY$W_RB_TXTOFF(R4),R0    ; GET THE LENGTH
                09 13            0793  1401          BEQL    210$                      ; IF THE LENGTH IS ZERO THEN DON'T SAVE
61   00   00 B4    50 2E         0795  1402          MOVTC   R0,@TTY$L_RB_TXT(R4),#0,(R1),-
          00 B4    50            079B  1403                  R0,@TTY$L_RB_TXT(R4)      ; MOVE THE DATA THRU THE FALLBACK TABLE
                3F BA            079E  1404 210$:    POPR    #^M<R0,R1,R2,R3,R4,R5>    ; RESTORE THE REGISTERS AND
              FF92 31            07A0  1405 220$:    BRW     END_FALL
                                07A3  1406 .Disable lsb
```

```
                                                H  8
07A3  1408
07A3  1409          .SBTTL  End of module
07A3  1410
07A3  1411          .END
```

```
CLASS_MODEM_DIS          ********    X   02
CNT                    = 00000001
COM$POST                 ********    X   02
DO_CONNECT               00000037 R      02
DO_DISCONNECT            000000A4 R      02
DO_EXIT                  00000422 R      02
DO_HANGUP                000000B5 R      02
DO_MAINT                 000000BF R      02
DO_READ                  0000010D R      02
DO_SET                   000001C1 R      02
DO_SETC                  000001B5 R      02
DO_SETM                  000001B2 R      02
DO_WRITE                 00000444 R      02
END_FALL                 00000735 R      02
F                      = 00000000
FIND_BOL_NOCLEAR         ********    X   02
INSERT_PKT               000004D9 R      02
IO$M_FCODE             = 0000003F
IO$V_BREAKTHRU         = 00000009
IO$V_CANCTRLO          = 00000006
IO$V_ENABLMBX          = 00000007
IO$V_EXTEND            = 0000000F
IO$V_LOOP              = 00000007
IO$V_LOOP_EXT          = 0000000C
IO$V_NEWLINE           = 0000000A
IO$V_PURGE             = 0000000B
IO$V_SET_MODEM         = 0000000A
IO$V_TT_DISCON         = 0000000C
IOC$REQCOM               ********    X   02
IPL$_QUEUEAST          = 00000006
IRP$B_RMOD             = 0000000B
IRP$L_ARB              = 00000058
IRP$L_AST              = 00000010
IRP$L_IOST1            = 00000038
IRP$L_IOST2            = 0000003C
IRP$L_MEDIA            = 00000038
IRP$L_PID              = 0000000C
IRP$L_SVAPTE           = 0000002C
IRP$L_TT_TERM          = 0000003C
IRP$L_UCB              = 0000001C
IRP$L_VAL5             = 0000009C
IRP$Q_TT_STATE         = 00000040
IRP$S_FCODE            = 00000006
IRP$V_FCODE            = 00000000
IRP$W_BCNT             = 00000032
IRP$W_BOFF             = 00000030
IRP$W_FUNC             = 00000020
IRP$W_TT_PRMPT         = 0000004C
MODEM$C_INIT           = 00000000
MODEM$C_SHUTDWN        = 00000001
NOPRIV_EXIT              0000043C R      02
PORT_STARTIO           = 00000000
PRV$V_LOG_IO           = 00000007
PRV$V_PHY_IO           = 00000016
QUEUE_LAST               000004D5 R      02
QUEUE_PKT                0000048C R      02
READ$DONE                00000730 R      02
SS$_ABORT              = 0000002C
SS$_BADESCAPE          = 0000003C
SS$_NOPRIV             = 00000024
SS$_NORMAL             = 00000001
SS$_NOSUCHDEV          = 00000908
SS$_PARTESCAPE         = 000001FC
SS$_TIMEOUT            = 0000022C
START_PKT                000004E6 R      02
T                      = 00000005
TRANSITION_NOCHECK       ********    X   02
TT$C_BAUD_9600         = 0000000F
TT$M_DS_DTR            = 00000002
TT$M_DS_RTS            = 00000010
TT$M_DS_SECTX          = 00000008
TT$M_MBXDSABL          = 00010000
TT$M_MODEM             = 00200000
TT$M_NOBRDCST          = 00020000
TT$M_NOECHO            = 00000002
TT$M_ODD               = 00000080
TT$M_PARITY            = 00000040
TT$M_PASSALL           = 00000001
TT$M_REMOTE            = 00002000
TT$V_ALTDISPAR         = 0000000A
TT$V_ALTFRAME          = 00000004
TT$V_ALTRPAR           = 00000005
TT$V_CRFILL            = 0000000A
TT$V_DISPARERR         = 00000009
TT$V_EIGHTBIT          = 0000000F
TT$V_ESCAPE            = 00000003
TT$V_LFFILL            = 0000000B
TT$V_MODEM             = 00000015
TT$V_PARITY            = 00000006
TT$V_PASSALL           = 00000000
TT$V_READSYNC          = 00000012
TT$V_REMOTE            = 0000000D
TT$V_TTSYNC            = 00000005
TT$V_TWOSTOP           = 00000008
TT2$M_ALTYPEAHD        = 00000080
TT2$M_DCL_MAILBX       = 00000200
TT2$M_DISCONNECT       = 00020000
TT2$M_DMA              = 00000040
TT2$M_XON              = 00000020
TT2$V_ALTYPEAHD        = 00000007
TT2$V_AUTOBAUD         = 00000001
TT2$V_DISCONNECT       = 00000011
TT2$V_DMA              = 00000006
TT2$V_EDITING          = 0000000C
TT2$V_FALLBACK         = 0000000E
TT2$V_HANGUP           = 00000002
TT2$V_LOCALECHO        = 00000000
TT2$V_MODHANGUP        = 00000003
TT2$V_PASTHRU          = 00000012
TT2$V_SECURE           = 00000010
TT2$V_SETSPEED         = 00000008
TT2$V_XON              = 00000005
TTY$A_INPFALL            ********    X   02
TTY$A_TA_RCL           = 00000018
```

```
TTY$B_WB_FIPL                   = 0000000B
TTY$CRE_FORK                      ********    X   02
TTY$C_CR                        = 0000000D
TTY$C_FC_SETC                   = 00000003
TTY$DONE                          00000735 R    02
TTY$DS_SET                        ********    X   02
TTY$GETNEXTCHAR                   ********    X   02
TTY$GETNXTWRITE                   00000548 RG   02
TTY$K_ER_ECHLINE                = 00000002
TTY$K_TA_RCLLEN                 = 00000100
TTY$LOCK                          ********    X   02
TTY$L_RB_LIN                    = 0000002C
TTY$L_RB_TXT                    = 00000000
TTY$L_WB_BLINK                  = 00000004
TTY$L_WB_END                    = 00000020
TTY$L_WB_FLINK                  = 00000000
TTY$L_WB_FR3                    = 00000010
TTY$L_WB_IRP                    = 00000024
TTY$L_WB_RETADDR                = 0000002C
TTY$MAINT                         ********    X   02
TTY$M_PC_DMAENA                 = 00000002
TTY$M_PC_XOFENA                 = 00000040
TTY$M_ST_BACKSPACE              = 00000020
TTY$M_ST_BADESC                 = 00000100
TTY$M_ST_CTRLO                  = 00000001
TTY$M_ST_CTRLR                  = 00040000
TTY$M_ST_DEL                    = 00000002
TTY$M_ST_ECHAES                 = 02000000
TTY$M_ST_EDITING                = 00100000
TTY$M_ST_EDITREAD               = 00000200
TTY$M_ST_EOL                    = 00000100
TTY$M_ST_ESC                    = 00000080
TTY$M_ST_ESC_O                  = 00004000
TTY$M_ST_MULTI                  = 00000040
TTY$M_ST_NL                     = 00000200
TTY$M_ST_NOECHO                 = 00000008
TTY$M_ST_NOFLTR                 = 00000040
TTY$M_ST_OVERSTRIKE             = 00800000
TTY$M_ST_PASALL                 = 00000004
TTY$M_ST_PRE                    = 04000000
TTY$M_ST_PROMPT                 = 00000020
TTY$M_ST_QUOTING                = 00400000
TTY$M_ST_RDVERIFY               = 00000400
TTY$M_ST_READ                   = 00001000
TTY$M_ST_RECALL                 = 00000800
TTY$M_ST_RECONNECT              = 10000000
TTY$M_ST_REFRSH                 = 00000400
TTY$M_ST_SENDLF                 = 00000010
TTY$M_ST_SKIPCRLF               = 00080000
TTY$M_ST_SKIPLF                 = 00002000
TTY$M_ST_TERMNORM               = 01000000
TTY$M_ST_WRAP                   = 00008000
TTY$M_ST_WRITE                  = 00000080
TTY$M_ST_WRTALL                 = 00000010
TTY$PURGE_AHEAD                   ********    X   02
TTY$READONE                       0000063D RG   02
TTY$RESTARTIO                     ********    X   02
TTY$RESUME                        ********    X   02
TTY$SETUP_READ                    ********    X   02
TTY$SET_LINE                      ********    X   02
TTY$STARTIO                       00000000 RG   02
TTY$STARTOUTPUT                   00000532 RG   02
TTY$SYNCH                         ********    X   02
TTY$V_FD_DISCONNECT             = 00000002
TTY$V_FD_GETAHD                 = 00000001
TTY$V_PC_DMAAVL                 = 00000002
TTY$V_PC_NOCRLF                 = 00000007
TTY$V_ST_ESCAPE                 = 0000000B
TTY$V_ST_PASALL                 = 00000002
TTY$V_ST_RDVERIFY               = 0000000A
TTY$V_SX_BACKSPACE              = 00000005
TTY$V_SX_BADESC                 = 00000028
TTY$V_SX_CTRLO                  = 00000020
TTY$V_SX_CTRLR                  = 00000032
TTY$V_SX_DEL                    = 00000021
TTY$V_SX_ECHAES                 = 00000039
TTY$V_SX_EDITING                = 00000034
TTY$V_SX_EDITREAD               = 00000009
TTY$V_SX_EOL                    = 00000008
TTY$V_SX_ESC                    = 00000027
TTY$V_SX_ESC_O                  = 0000002E
TTY$V_SX_MULTI                  = 00000006
TTY$V_SX_NL                     = 00000029
TTY$V_SX_NOECHO                 = 00000023
TTY$V_SX_NOFLTR                 = 00000026
TTY$V_SX_OVERSTRIKE             = 00000037
TTY$V_SX_PASALL                 = 00000022
TTY$V_SX_PRE                    = 0000003A
TTY$V_SX_PROMPT                 = 00000025
TTY$V_SX_QUOTING                = 00000036
TTY$V_SX_RDVERIFY               = 0000000A
TTY$V_SX_READ                   = 0000000C
TTY$V_SX_RECALL                 = 0000000B
TTY$V_SX_RECONNECT              = 0000003C
TTY$V_SX_REFRSH                 = 0000002A
TTY$V_SX_SENDLF                 = 00000004
TTY$V_SX_SKIPCRLF               = 00000033
TTY$V_SX_SKIPLF                 = 0000002D
TTY$V_SX_TERMNORM               = 00000038
TTY$V_SX_WRAP                   = 0000002F
TTY$V_SX_WRITE                  = 00000007
TTY$V_SX_WRTALL                 = 00000024
TTY$WRITEDONE                     00000587 RG   02
TTY$WRITEPOST                     0000062A RG   02
TTY$WRTSTARTIO                    00000452 RG   02
TTY$W_RB_CPZORG                 = 0000003A
TTY$W_RB_LINOFF                 = 00000030
TTY$W_RB_LINREST                = 00000032
TTY$W_RB_MODE                   = 00000044
TTY$W_RB_SIZE                   = 00000008
TTY$W_RB_TXTOFF                 = 0000003C
TTY$W_TA_RCLSIZ                 = 00000014
TTY$W_WB_BCNT                   = 0000002A
TTY$W_WB_SIZE                   = 00000008
```

```
TTY$W_WB_STATUS                 = 00000028
TTY$XOFF                        ******** X   02
UCB$B_DEVCLASS                  = 00000040
UCB$B_DEVTYPE                   = 00000041
UCB$B_FIPL                      = 0000000B
UCB$B_TT_CRFILL                 = 000000F6
UCB$B_TT_DEPARI                 = 000000EC
UCB$B_TT_DETYPE                 = 000000F0
UCB$B_TT_LASTC                  = 000000FF
UCB$B_TT_LFFILL                 = 000000F7
UCB$B_TT_LINE                   = 000000FE
UCB$B_TT_MAINT                  = 0000012A
UCB$B_TT_OLDCPZORG              = 0000012B
UCB$B_TT_OUTYPE                 = 0000010B
UCB$B_TT_PARITY                 = 000000F8
UCB$L_DEVDEPEND                 = 00000044
UCB$L_DEVDEPND2                 = 00000048
UCB$L_IRP                       = 00000058
UCB$L_PDT                       = 00000084
UCB$L_SVAPTE                    = 00000078
UCB$L_TL_PHYUCB                 = 000000A0
UCB$L_TT_DECHA1                 = 000000C8
UCB$L_TT_DECHAR                 = 000000C4
UCB$L_TT_LOGUCB                 = 000000C0
UCB$L_TT_PORT                   = 00000118
UCB$L_TT_TYPAHD                 = 000000E4
UCB$L_TT_WBLINK                 = 000000D0
UCB$L_TT_WFLINK                 = 000000CC
UCB$L_TT_WRTBUF                 = 000000D4
UCB$M_CANCEL                    = 00000008
UCB$M_TIMOUT                    = 00000040
UCB$M_TT_DISPARERR              = 00000002
UCB$M_TT_DSBL                   = 00000080
UCB$M_TT_LEN                    = 00000018
UCB$M_TT_NOTIF                  = 00000004
UCB$M_TT_ODD                    = 00000080
UCB$M_TT_PARTY                  = 00000040
UCB$M_TT_STOP                   = 00000020
UCB$M_TT_TIMO                   = 00000002
UCB$V_INT                       = 00000001
UCB$V_TT_DISPARERR              = 00000001
UCB$V_TT_LEN                    = 00000003
UCB$V_TT_USERFRAME              = 00000002
UCB$W_BOFF                      = 0000007C
UCB$W_DEVBUFSIZ                 = 00000042
UCB$W_DEVSTS                    = 00000068
UCB$W_STS                       = 00000064
UCB$W_TT_CURSOR                 = 000000FC
UCB$W_TT_DESPEE                 = 000000E8
UCB$W_TT_PRTCTL                 = 00000122
UCB$W_TT_SPEED                  = 000000F4
W0                              = 00001F60
W1                              = 07DC45E2
WRITEPOST                         000005AB R     02
WRTSTARTIO                        00000491 R     02
X                               = 000007DC
X0                              = 00000000
                                = 00000002
XOFF                            = 00000000
Z0                              = 00000000
Z1                              = 00000000
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	00000000 (0.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
$$$115_DRIVER	000007A3 (1955.)	02 (2.)	NOPIC USR CON REL LCL NOSHR EXE RD WRT NOVEC LONG

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	35	00:00:00.03	00:00:00.85
Command processing	118	00:00:00.33	00:00:03.16
Pass 1	611	00:00:18.41	00:01:04.16
Symbol table sort	0	00:00:02.66	00:00:10.55
Pass 2	264	00:00:03.99	00:00:13.95
Symbol table output	34	00:00:00.19	00:00:00.19
Psect synopsis output	2	00:00:00.02	00:00:00.67
Cross-reference output	0	00:00:00.00	00:00:00.00
Assembler run totals	1066	00:00:25.65	00:01:33.54

The working set limit was 2100 pages.
152906 bytes (299 pages) of virtual memory were used to buffer the intermediate code.
There were 130 pages of symbol table space allocated to hold 2384 non-local and 89 local symbols.
1411 source lines were read in Pass 1, producing 18 object records in Pass 2.
56 pages of virtual memory were used to define 53 macros.

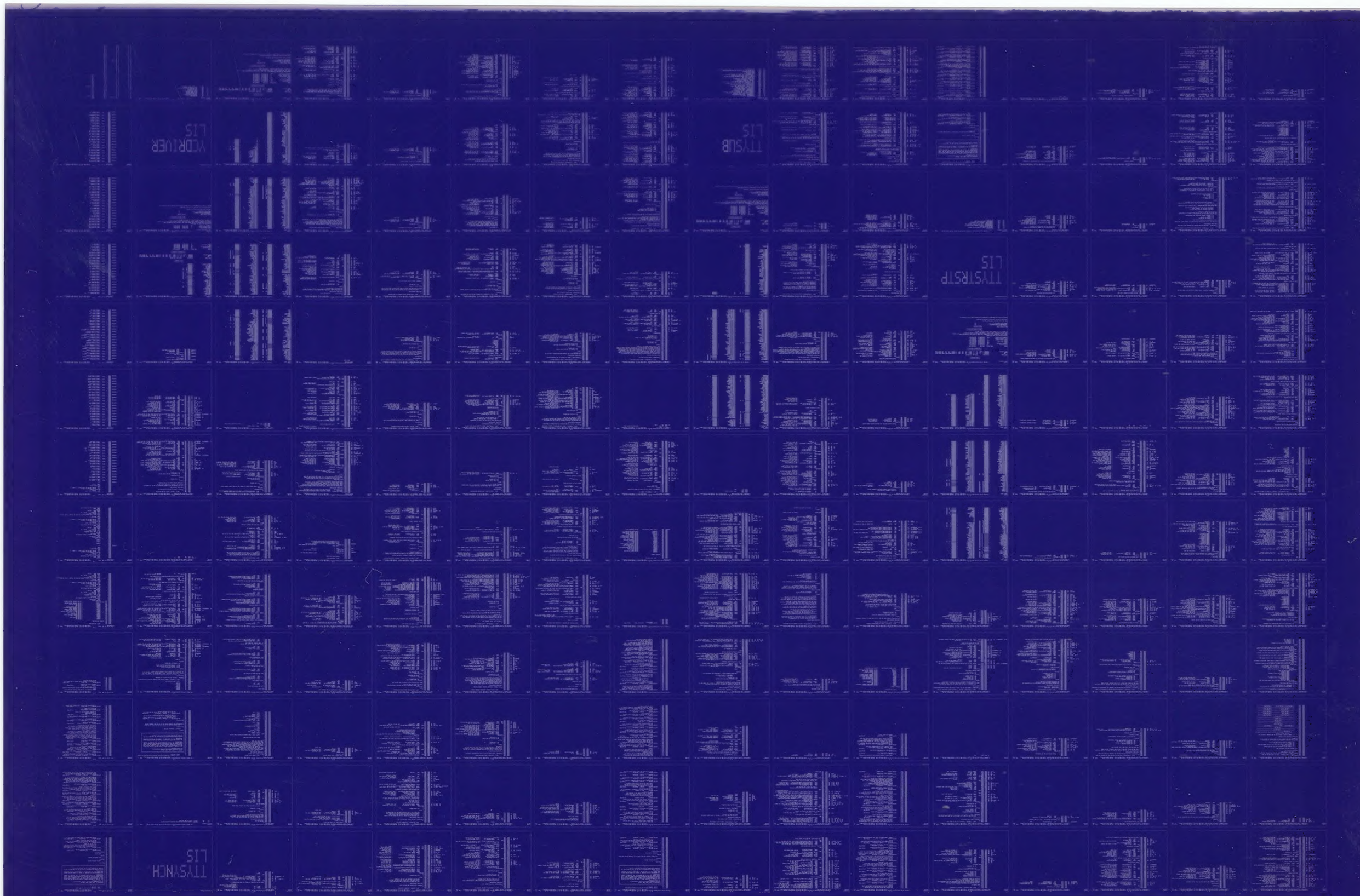
Macro library statistics

Macro library name	Macros defined
_255DUA28:[SYS.OBJ]LIB.MLB;1	22
_255DUA28:[SYSLIB]STARLET.MLB;2	10
TOTALS (all libraries)	32

2769 GETS were required to define 32 macros.

There were no errors, warnings or information messages.

MACRO/LIS=LIS$:TTYSTRSTP/OBJ=OBJ$:TTYSTRSTP MSRC$:TTYSTRSTP/UPDATE=(ENH$:TTYSTRSTP)+EXECML$/LIB


YCDRIVER
LIS
TTYSUB
LIS
TTYSTRSTP
LIS
TTYSYNCH
LIS